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Studies in the Botany of the Southeastern United States.—XIV.

BY JOHN K. SMALL.

I. HITHERTO UNDESCRIBED SPECIES.

NYMPHAEA MACROPHYLLA.

Perennial from very thick horizontal rootstocks, bright green. Foliage glabrous or nearly so: leaves (emersed) leathery; petioles short, sometimes sparingly pubescent; blades oblong-ovate, 3–8 dm. long, obtuse, notched at the apex, 1–2.5 dm. broad at the middle; sinus V-shaped, or rarely closed: flowers erect, subglobose, 3–5 cm. in diameter: sepals leathery, 2.5–3 cm. long, concave: petals yellow, slightly longer than the sepals: stamens numerous: stigmatic disk becoming 3–3.5 cm. broad, often deeply crenate, the coarse stigmatic lines not approaching the edge: capsule ovoid, 3–4 cm. high, coarsely ribbed above the middle: seeds subglobose, 5–6 mm. in diameter.

In ponds, creeks and slow streams, Florida to Louisiana. Spring to fall.

Both old and recent specimens of the common species of *Nymphaea* of Florida and the other Gulf States indicate that it is specifically distinct from the northern *Nymphaea advena*. Plants belonging to this segregate may be recognized by the very large leaf-blades which are of a peculiar ovate-oblong shape and with a midrib that dries flat. In the flower the larger stigmatic disk is often much more deeply crenate than in the case of *Nymphaea advena* and its stigmatic lines, although larger, terminate remotely from the edge of the disk.

I have seen specimens from several of the Gulf States:

[Issued 10 September.]

Florida: In tidal creeks, Duval Co., May; *A. H. Curtiss*, no. 102. Eustis Lake Co., Aug. 16–25, 1894, *G. V. Nash*, no. 1751. Miami river, March 7, 1892, *J. H. Simpson*. Apalachicola, *Chapman*.

Louisiana: Hale.

AQUILEGIA AUSTRALIS.

Perennial, bright green. Stem erect, usually solitary, 3–9 dm. tall, branching above, finely pubescent or glabrate in parts: leaves with slender petioles, except on upper part of the stem; blades twice ternate; leaflets thin, reniform, suborbicular or orbicular-obovate, 1–2 cm. long, glaucescent, especially beneath, crenately toothed or lobed, rounded or subcordate at the base: corolla mainly scarlet: sepals erect, lanceolate or oblong-lanceolate, somewhat acuminate, 1.5 cm. long, scarlet: spurs 3–3.5 cm. long, rather abruptly narrowed below the middle: styles more than twice as long as the ovary: follicles about 1.5 cm. long, about as long as the bristle-like style.

On limestone cliffs and bluffs, Florida to Texas. Spring.

Several specimens of this hitherto undescribed species have been lying in the herbarium of Columbia University for many years. The species apparently belongs to that class of plants which is peculiar to the Gulf States. It can be distinguished from *Aquilegia Canadensis* at a glance by its more slender habit, pale green or glaucescent foliage and especially by the narrow elongated sepals. The spur is more abruptly narrowed below the middle than it is in *Aquilegia Canadensis*.

The following specimens are referred here:

Florida: Lime cliffs, Marianna, *Chapman*.

Texas: Blanco Bottoms, April, 1856; Valley of the Blanco, *Wright*.

HEUCHERA MACRORHIZA.

Perennial, bright green. Rootstocks stout, woody, 1–3 dm. long, scaly: leaves basal; petioles 1–3 dm. tall, densely villous; blades suborbicular in outline, 8–20 cm. in diameter, shallowly 5–9-lobed (lobes much broader than long), sharply, closely and irregularly dentate with apiculate teeth, pubescent on both sides, sparingly so above, densely ciliate, cordate: scapes erect or nearly so, 2–5 dm. tall, naked or with several scales, surpassing the

leaves: panicles 5–12 cm. long, nearly cylindric: calices densely pubescent, 2 mm. long or 2.5 mm. long at maturity; tube campanulate; segments oblong or ovate-oblong, about as long as the tube, erect: petals linear from a filiform base, fully twice as long as the calyx-segments: capsules about equaling the calyx at maturity, tipped by the slender styles.

On river bluffs near Nashville, Tennessee. Summer. This relative of *Heuchera villosa* is apparently about as restricted in its distribution as that species is widely dispersed. The two species are quite similar in habit, but differential characters are plentiful from the rootstock to inflorescence. The woody rootstock varying from 1.5–2 cm. thick is unknown in *Heuchera villosa*. The pubescence wherever present is of a different type, the individual trichomes being shorter and stouter. A conspicuous character is the shallowly many-lobed leaf-blades with their closely dentate margins. A peculiar and apparently constant difference exists in the inflorescence: in the case of the species just described the pedicels are more densely pubescence than the calices, while in the case of *Heuchera villosa* the calyx is the more densely pubescent member.

The original specimens were collected by Dr. Gattinger along the Cumberland River at Nashville, Tennessee, August, 1878. These specimens are in the Gattinger Herbarium at the University of Tennessee. I am indebted to Prof. S. M. Bain for the use of this material.

EUPHORBIA APOCYNIFOLIA.

Perennial, bright green. Stems solitary or tufted, erect or ascending, 2–6 dm. tall, slender, sparsely pubescent or glabrate, zigzag, at least at maturity, topped by a 2–3-rayed umbel: rays dichotomous, wire-like or filiform, ascending: leaves alternate except the whorl or pair subtending the umbel; blades thinnish, oblong to oval, 2–7 cm. long, obtuse, slightly revolute, pale beneath, with glaucous midrib; petioles 3–6 mm. long, densely villous: bracts opposite, similar to the leaves but smaller: peduncles filiform, glabrous: involucres campanulate, barely 1.5 mm. high, glabrous: glands transversely oblong, about 0.5 mm. broad: appendages white, orbicular-cuneate, 1.5–2 mm. long, rounded at the apex.

In sandy soil, Florida. Fall.

Euphorbia apocynifolia is related to *Euphorbia corollata* but differs in the more slender habit, the broader and thinner leaf-blades and the densely villous petioles. The petal-like appendages are smaller than those of *Euphorbia corollata* and are rounded at the apex. The habit of the newly described species suggests that of *Euphorbia paniculata*.

The original specimens of *Euphorbia apocynifolia* were collected by Mr. Geo. V. Nash at Quincy, Gadsden County, Florida, on September 4, 1895, number 2567.

SIDA LEPTOPHYLLA.

Perennial (?), thinly pubescent. Stems erect, over 10 dm. tall (in specimens seen), widely branching: leaves numerous, blades thin, linear to linear-oblong, 2–10 cm. long, acute, sharply serrate with short flaring teeth above a short entire base, paler beneath than above, obtuse or rounded at the base; petioles 3–10 mm. long; stipules subulate, filiform: pedicels 2–8 mm. long: calices finely pubescent; segments 4–5 mm. long, triangular, acute, or somewhat acuminate, about as long as the tube: corollas about 2.5 cm. broad: fruit 6–7 mm. broad; carpels 2-ridged above, not pointed, glabrous.

In sandy soil, Georgia.

This species gives us an eastern relative of *Sida Lindheimeri*. It is related to *Sida Neo-Mexicana* by its inflorescence, mainly by the short peduncles, but in other parts and in habit it is more like *Sida Lindheimeri*. From the latter species it differs by the short-peduncled, often clustered flowers, the thinner leaf-blades with their finer and sharper teeth and the glabrous pointless carpels. The specimens on which the species is founded were collected in Georgia by Dr. Boykin and his label contains this record, "This is the large flowering *Sida*, of which there are seeds in the other box. If not *S. gracilis*, is new. I have thought it not described by Mr. E. [lliott] and if so incorrectly."

RHEXIA FILIFORMIS.

Perennial, slender, sparingly pubescent. Stems erect, wire-like, 1–4 dm. tall, villous-hirsute, simple or branched, terete or nearly so; branches filiform: leaves quite numerous; blades linear-filiform or filiform, 1–3 cm. long, acute, serrulate, sessile, the larger ones involutely folded: flowers in open cymes, short-pedi-

celled: calyx glabrous; segments lanceolate, acuminate: corollas white or pale purple; petals less than 1 cm. long: anthers linear, 6 mm. long, spurred at the base: capsules subglobose.

In sandy soil, Georgia and Florida. Summer.

While collecting along the southern border of Georgia I met this delicate little species of *Rhexia* at various places. It is related to *Rhexia lanceolata* but is smaller and all its parts are much more slender. The linear-filiform or filiform leaves, the small corollas and the glabrous calices are all diagnostic characters readily separating *Rhexia filiformis* from *Rhexia lanceolata.*

CONRADINA PUBERULA.

A much branched shrub, 3–7 dm. tall: foliage cinereous-puberulent: leaves numerous, often clustered in axils; blades narrowly linear, 1–2.5 cm. long, obtuse, entire, strongly revolute, sessile: clusters 2–6-flowered, often forming a continuous raceme; pedicels commonly 1–2 mm. long: calices 5–6 mm. long, puberulent, tubes slightly ribbed; upper lip with 3 ovate or ovate-lanceolate acute ascending teeth; lower lip with 2 lanceolate-subulate teeth: corollas 12–15 mm. long; tube as long as the calices or nearly so; upper lip retuse; lower lip 3-lobed, lateral lobes rounded, middle lobe cuneate-flabellate, deeply notched: nutlets 1 mm. long, globose-oval, smooth and glabrous.

In sand, Florida. Spring and summer.

Conradina is not a monotypic genus, for it is perfectly clear that two distinct species have been associated under the name *Conradina canescens.* Both species are peculiar to Florida, and the one heretofore undescribed is apparently the more widely distributed. *Conradina puberula* may be distinguished from *Conradina canescens* at a glance by the larger size of all its parts and the puberulence of its foliage, hirsute pubescence being usually absent and being found, if present, only about the mouth of the calyx. The calyx is longer than that of *Conradina canescens.* Prominent characters exist in the corolla, in which the upper lip is retuse and the middle lobe of the lower lip is cuneate-flabellate and deeply notched. In *Conradina canescens* the upper lip is rounded, and the rounded middle lobe of the lower lip is not prominently produced beyond the lateral lobes. The newly described species is represented in the herbarium of Columbia University as follows:

Florida: Apalachicola, old specimen, collector uncertain; later specimen, *A. H. Curtiss*, no. 2014. Also two specimens collected by Dr. Chapman.

The habit of *Conradina puberula* suggests that of *Hypericum galioides*.

KOELLIA BEADLEI.

Perennial, deep green. Stem erect or ascending, 5–8 dm. tall, simple or sparingly branched, minutely pubescent: leaves opposite, lower glabrate but resinous-dotted, the floral slightly canescent; blades oblong-lanceolate, or those of the branches elliptic-lanceolate to ovate, all acute or acuminate, 3–8 cm. long, serrate, rounded or subcordate at the base; petioles 1–3 mm. long: clusters solitary or few, terminal, dense, 1–2 cm. broad: bracts narrowly linear or slightly broadened at the middle: calices puberulent, 4–5 mm. long, tube finely ribbed; teeth triangular-lanceolate, with subulate tips barely one third as long as the tube: corollas 6–7 mm. long; tube not surpassing the calyx; upper lip oblong, obtuse; lower lip 3-lobed, middle lobe oblong, notched, lateral lobes rounded: filaments and style glabrous.

On rocks, mountains near Highlands, North Carolina. Summer and fall.

The center of distribution of the *Koelliae* furnishes us with still another species. The plant in question is related to *Koellia pycnanthemoides*, but the leaves and stem are destitute of the peculiar pubescence characteristic of such plants as *Koellia pycnanthemoides*, *K. albescens* and *K. incana*. The leaves suggest those of certain species of the genus *Monarda*. They are conspicuous on account of a very fine sprinkling of sparkling glands and the prominent whitish nerves beneath. The calyx-segments are subulate from a triangular-lanceolate base and barely one third as long as the tube.

The original specimens were collected on mountain rocks, Highlands, Macon County, North Carolina, September 14, 1897. They were distributed by the Biltmore Herbarium, for whose curator the species is named. It is numbered 5744.

PENTSTEMON CALYCOSUS.

Perennial, minutely pubescent or glabrate. Stem erect, 4–7 dm. tall, simple below: leaves various; basal and lower stem-leaves spatulate, upper stem-leaves opposite; blades oblong to lance-

olate, acute or acuminate, sharply serrate, closely sessile and partly clasping: panicles rather loosely flowered: calices sparingly glandlar-pilose, segments about 1 cm. long, with a narrowly lanceolate base and narrowly linear tip: corolla purple, about 2.5 cm. long; tube abruptly dilated about the middle; segments ovate or broadly oblong-ovate, those of the upper lip much smaller than those of the lower: sterile filaments sparingly bearded above the middle: capsules ovoid, 5–6 mm. high.

On bluffs, Tennessee and Louisiana. Spring.

In a former number of this journal* I published a note on the occurrence of *Pentstemon Smallii* at Nashville, Tennessee. A further study of the section of *Pentstemon* to which the species in question belongs convinces me that the Nashville plants are specifically distinct from any described form. The elongated calyx-segments are diagnostic. An old specimen with mature fruit but no flowers preserved in the herbarium of Columbia University seems to belong in *Pentstemon calycosus*. Its label bears this record, "Fertile soils, Louisiana, Hale; April."

PENTSTEMON HELLERI.

Perennial, mostly puberulent, or glabrate, below the inflorescence, thence minutely glandular-pubescent. Stems erect or ascending, 3–6 dm. tall, simple up to the inflorescence: leaves opposite, glabrous or nearly so, lustrous; blades various, those of the basal and lower stem leaves oblong-spatulate or nearly linear, 6–10 cm. long, acute, narrowed into winged petioles, blades of upper leaves oblong to broadly ovate, acute, sessile; all undulats or slightly toothed: calices densely glandular-pubescent; sege ments ovate to elliptic-ovate, 8–10 mm. long, acutish: corollas white or rose, sometimes tinged with blue, minutely glandular-pubescent, 3–3.5 cm. long, rather gradually enlarged, upper lip with shallowly notched lobes, lower lip with truncate or retuse lobes: capsules conic-ovoid, at least 1 cm. long, not reticulated, much surpassing the calyx.

On prairies, Kerrville, Texas. Spring.

Mr. Heller informs me that he very reluctantly associated the name *Pentstemon Cobaea* with his number 1610 in his distribution of "Plants of Southern Texas." These specimens form the type of a species perfectly distinct from *Pentstemon Cobaea*. Plants belonging here may be found under the name *Pentstemon Cobaea* in vari-

* Bull. Torr. Bot. Club, **21**: 304. 1894.

ous herbaria, but they may be separated by the much smaller and differently shaped corollas and the smaller capsules which conspicuously surpass the calyx. The original specimens are from Kerrville, Kerr County, Texas, collected in April and June, 1894.

LACINARIA FLABELLATA.

Perennial from globose or spheroidal corms, showy. Stems erect, 3–6 dm. tall, simple, lanuginose, angled, usually solitary: leaves rather numerous; blades linear or nearly so, lower ones 5–10 cm. long, acute or acutish, spreading, narrowed into margined petioles, upper much reduced, sessile, more or less strongly reflexed, all densely punctate, glabrous: racemes conspicuous, 1–2 dm. long, 3 cm. thick: heads narrow, ascending, 1–1.5 cm. long: bracts linear-lanceolate to linear, outer somewhat keeled, with spreading entire or denticulate acuminations, inner with pale magenta fan-shaped erose-dentate tips: pappus bristles somewhat plumose, rather few: achenes densely pubescent.

In dry open woods, St. Helena Island, South Carolina. Fall.

One of the neglected and yet extremely interesting portions of the Southern States is the territory formed by the numerous islands along the Atlantic coast. Collections from some of these islands have lately been put at my disposal by Mr. A. Cuthbert, and the indications are that a complete series of specimens representing the flora of the region in question would reveal many curious and hitherto unknown species. One of the more interesting plants from these islands is the above described *Lacinaria*, which makes a second species for the group in which *Lacinaria elegans* has previously stood alone. *Lacinaria flabellata* is of smaller stature than *L. elegans*. Chief among other differences between the two species is the character of the inner bracts of the involucres. The dilated, toothed, rounded or truncate tips of the bracts have nothing parallel in *L. elegans*. The original specimens were collected by Mr. A. Cuthbert on St. Helena Island, South Carolina, September, 1894.

LACINARIA LAXA.

Perennial, thinly tomentulose, or leaves glabrate. Stems erect, 4–6 dm. tall, stoutish, racemose above: leaves rather numerous; blades linear, sometimes rather broadly so, 1–2 dm. long, lower ones narrowed into short winged petioles, upper sessile, much re-

duced : peduncles villous, longer than the heads or shorter : heads loosely disposed, involucres short, about 5 mm. high, campanulate : bracts oblong or oblong-lanceolate, obtuse or acutish, keeled, conspicuously ciliate, lax at maturity, outer purple, inner purple-tipped : pappus barely barbellulate : achenes 3–3.5 mm. long, finely but rather densely pubescent.

In sand, Cape Florida, Florida. Spring.

The above is most closely related to *Lacinaria graminifolia pilosa*, but the characteristic ciliation of the petioles is lacking and the involucres are campanulate and shorter. The bracts of the involucres are shorter and narrower at the apex and very characteristic on account of the copious and conspicuous cilia.

The original specimens were collected by Mr. J. H. Simpson at Cape Florida, Florida, on March 14, 1892.

LACINARIA REGIMONTIS.

Perennial from small subglobose rootstocks, nearly glabrous. Stems erect, 3–9 dm. tall, usually paniculately branched, sometimes spicately racemose : leaves rather few, 1–2 dm. long or longer, reduced above; blades narrowly linear, narrowed into winged sparingly ciliate petioles below, sessile above, all erect or ascending : involucres numerous, cylindric, becoming obconic, 8–10 mm. high, conspicuous on account of the slightly spreading bracts, erect or ascending, short-peduncled or some nearly sessile : bracts oblong-ovate to linear-oblong, acute to mucronate or the inner slightly hooded, the outer sometimes obtuse, all glandular-punctate, ciliolate, mostly with ring-like margins : pappus barbellulate : achenes 3.5–4 mm. long, ribbed, sparingly pubescent.

On wooded slopes, King's Mountain, North Carolina. Summer and fall.

The species just described suggests *Lacinaria graminifolia pilosa* in habit, but it has a very characteristic involucre ; this member becomes obconic and quite elongated at maturity, while the bracts, excepting some at the base of the involucres, are acute or mucronate, densely punctate and conspicuously wing-margined.

The original specimens were collected by the writer on the slopes of King's Mountain, North Carolina, on August 27 and 30, 1894.

LACINARIA MICROCEPHALA.

Perennial from ovoid or subglobose corms. Stems erect or ascending, rather slender, 3–7 dm. tall, solitary or tufted, striate-

ridged, strict, rather slender, simple at least below the inflorescence: leaves numerous; blades linear, very narrowly so except those of lower leaves, 5–10 cm. long or shorter above, erect or strongly ascending, sparingly punctate, lower ones narrowed into sparingly ciliate petioles: heads numerous, slender, short-peduncled or the peduncles sometimes elongated and minutely bracted: involucres cylindric, 5–7 mm. high: bracts glabrous or nearly so, erect, appressed, obtuse, outer ovate, inner oblong, much longer than the outer, pappus-bristles coarsely barbellulate: achenes cuneate, about 2.5 mm. long, densely pubescent.

In sandy soil, Cumberland Mountains, Tennessee. Summer.

The segregate just described has heretofore been associated with *Lacinaria graminifolia*. However, its foliage is glabrous except for an occasional cilium on the petioles of the lower leaves or the edge of the involucral bracts. The cylindric heads are only about one-half as large as those of *Lacinaria graminifolia* and contain few flowers.

The original specimens were collected by Dr. Gattinger at Tullahoma, on the Cumberland Mountains, Tennessee, in August, 1867; September, 1877; August, 1878, and the fourteenth day of the same month, 1886. I am indebted to Prof. S. M. Bain, of the University of Tennessee, for the loan of the above cited specimens from the University Herbarium.

SOLIDAGO DELICATULA.

Perennial, smooth and glabrous, deep green. Stems erect, 5–10 dm. tall, ridged, sparingly or widely branched above, strict: leaves numerous; blades thinnish, somewhat parchment-like at maturity, linear-elliptic to linear-lanceolate or nearly linear, 2–8 cm. long, acuminate, sharply serrate, beyond the gradually narrowed base, sessile or with short winged petioles: panicle narrow or, when well developed, with widely spreading and recurved branches: heads numerous, 3.5–5 mm. high, short-peduncled, contiguous: involucres narrow: bracts narrowly lanceolate to narrowly linear, acute, very variable in length: flowers 3–6: rays yellow, often 2–3, linear-oblong, 1.5–2.5 mm. long: achenes minutely pubescent.

On prairies, northern Texas.

The specimens here described form a very characteristic species. This is related to *Solidago rupestris* but differs in its usually more lax habit and the absence of pubescence except the cilia of

the leaves. With this exception the plants are smooth and glabrous throughout. The foliage is of a much deeper green than that of *Solidago rupestris* and the upper surface of the leaves is lustrous. The heads are twice as high as those of *Solidago rupestris* and suggest those of *Solidago odora*. The original specimens were collected by Mr. James S. Merriam, near Paris, in northern Texas, in 1872.

SOLIDAGO NASHII.

Perennial, deep green. Stems erect, 6–10 dm. tall, simple below the rather ample panicle, more or less pubescent, especially above the middle, striate, nearly straight: leaves numerous; blades linear or narrowly linear, 4–10 cm. long, attenuate at both ends, finely but rather remotely serrate or nearly entire, sessile: heads numerous, 5–6 mm. high, short-peduncled, contiguous: involucres campanulate at maturity, erect: bracts linear-lanceolate to linear, acutish to obtuse, the outer pubescent: flowers 12–17, crowded: rays yellow, 3–4, linear: achenes 1–1.5 mm. long, minutely pubescent.

In hammocks, middle and peninsular Florida. Spring.

Plants belonging here have hitherto been referred to *Solidago Leavenworthii*, but their true relationship is rather with *Solidago rupestris* and its allies. Like *Solidago rupestris* the foliage below the inflorescence is glabrous or nearly so, but the heads are at least twice and often thrice as large and the bracts and flowers more numerous.

The original specimens are both from Florida. The first one was collected many years ago in Middle Florida by Dr. Chapman. The second was collected by Mr. Nash at Eustis, peninsular Florida in May, 1894, no. 691.

SOLIDAGO DISPERSA.

Perennial, glabrous or nearly so. Stems erect, 8–10 dm. tall, ridged, loosely paniculate above: panicle narrow; branches slender or filiform: leaves rather few; blades narrowly elliptic to oblong-lanceolate, 2–10 cm. long, acute or acuminate, serrate, lower ones with winged petioles, upper sessile or nearly so: heads few, loosely disposed, 6–7 mm. high; terminal ones often drooping: involucres turbinate-campanulate at maturity: bracts narrowly oblong to linear, obtuse, with green tips: flowers 9–13: rays yellow, 2–3, oblong-linear, about 3 mm. long: achenes pubescent.

In the lower country, Louisiana.

Many distinct species are now associated together under the name of *Solidago Boottii*. The one just described belongs to this series and formed part of *S. Boottii* β of Torrey & Gray.* It is peculiar in being glabrous or nearly so above and with more or less pubescence on the lower leaves. The inflorescence is paniculate and very loosely disposed, while the branches of the panicle and the elongated peduncles are filiform or nearly so and quite weak. The teeth of the leaf-blades are more remote and appressed than those of *S. Boottii*.

The original specimens were collected by Dr. Leavenworth in Louisiana.

SOLIDAGO PLUMOSA.

Perennial, bright green, glabrous or nearly so below the inflorescence, inclined to be glutinous, especially above. Stems erect, often tufted, 4–10 dm. high, ridged, purple, strict: leaves alternate; blades spatulate to narrowly linear, 2–30 cm. long, obtuse, acute or acuminate, thickish, entire or remotely and shallowly toothed, narrowed into slightly margined petioles or the upper ones nearly sessile with smaller ones sometimes clustered in their axils: heads numerous, in narrow terminal panicles, 5–8 mm. long, often densely disposed: involucres campanulate at maturity: bracts linear, inner ones narrowly so, obtuse, erect: flowers 11–15, crowded; rays 3–5, yellow, 5–6 mm. long: achenes 3–3.5 mm. long, glabrous.

In cañons of Yadkin River, Stanley County, North Carolina. Summer and fall.

In a former issue of this journal† I called attention to the form just described as *Solidago plumosa*, hoping by that means to secure further data on its distribution. I am now convinced that the North Carolina plants are specifically distinct from *Solidago Purshii*, its more northern homologue. We have in the case of *Solidago Purshii* and *Solidago plumosa* two closely related but perfectly distinct species. The much larger size of the plants in the latter, the longer heads, and the perfectly glabrous achenes, serve to separate the two species.

* Fl. N. A. **2**: 215.

† Bull. Torr. Bot. Club, **23**: 300. 1896.

SOLIDAGO CHRYSOPSIS.

Perennial, slender, glabrous. Stem erect or ascending, wire-like, 2–3 dm. tall, paniculate above, nearly naked: leaves mainly basal or near the base of the stem, 6–20 cm. long or those on stem shorter; blades elongated linear, acute, entire or nearly so, acute, curved, slender-petioled: heads in narrow panicles 4–5 mm. high, conspicuous on account of the silvery-white pappus: involucres becoming lax: bracts thin, linear-lanceolate or linear, rather obtuse: flowers 11–14: rays yellow, several, linear: achenes finely pubescent.

In sand, Pine Key, Florida.

The specimens which form the basis of the species described above as *Solidago Chrysopsis* were included in *Solidago gracillima* by Dr. Gray and were collected by Mr. Blodgett on Pine Key, Florida. Primarily the species differs from *Solidago gracillima* in its very slender habit and the inflorescence which suggests that of some species of the genus *Chrysopsis*, similar also in habit to that of *Solidago laxa*. The stems bear very few leaves. The thin narrow linear or linear-lanceolate bracts of the involucres form a strong contrast with the thick broad bracts of *Solidago gracillima*. The several rays are also diagnostic so far as *Solidago gracillima* is concerned.

SOLIDAGO FLACCIDIFOLIA.

Perennial, glabrous below the inflorescence, bright green. Stems erect or ascending, 7–11 dm. tall, simple or nearly so, ridged, slightly zigzag: leaves alternate; blades elliptic, 6–15 cm. long, thin, acuminate, sharply serrate above the cuneate base, sessile or nearly so: heads few in axillary clusters, short-peduncled, 4 mm. high, clusters subtended by spatulate or elliptic-spatulate bracts: involucres campanulate: bracts linear, finely pubescent, obtuse, green or green-tipped: flowers 5–7, crowded: rays yellow, oblong or ovate-oblong, 3 mm. long: achenes pubescent.

On hillsides, Rome, Georgia. Fall. Like so many others of the species of the Southern States, *Solidago flaccidifolia* will doubtless prove to be a local species. It is most closely related to *Solidago pubens* from which it differs in the almost glabrous foliage, only the upper part of the inflorescence is pubescent and hairs are sparse, short and not spreading. The leaf-blades are larger and their margins are not toothed so far below the middle. The involucres

are shorter than those of *Solidago pubens* and the bracts less densely pubescent and broader.

The original specimens were found at Rome, Georgia, by Dr. Chapman, in September, 1872.

SILPHIUM VENOSUM.

Perennial, glabrous or nearly so. Stems erect, scape-like, 8–12 dm. tall, slender, corymbosely branched above, glaucous, channelled: leaves basal; blades ovate to oblong, 1–3 dm. long, with deep red nerves, pinnately parted; segments linear to linear-oblong, coarsely and irregularly toothed or incised, obtuse or acute; petioles about half as long as the blades, dilated at the base: heads few, showy: involucres campanulate, about 1 cm. high: bracts broadly oblong to orbicular-oval and oblong, rounded at the apex, ciliolate: rays yellow, linear or nearly so, 1–1.5 cm. long: disk-corollas 6 mm. long; segments broadly ovate, obtuse: achenes suborbicular, 1 cm. long; wings produced into acute teeth and forming narrow U-shaped sinus.

In sand, southeastern Georgia. Spring and summer.

So far as we know the species here described for the first time is peculiar to the pine barrens about the Okefenokee swamp and the valley of the St. Mary's River in Georgia, where the writer collected specimens in June, 1895. The species is related to *Silphium compositum*, having much the same habit. Diagnostic characters exist in both the foliage and the inflorescence; the petioles of the basal leaves are much shorter than the blades; the latter members are longer and narrower than those of *S. compositum*, pinnately parted into several segments which are coarsely toothed or incised. The whole surface of the leaf-blades is delicately marked with deep red veins. The large suborbicular achenes with their broad wings and long teeth form a strong contrast with the achenes of *Silphium compositum*.

RUDBECKIA TRUNCATA.

Perennial, sparingly hirsute or glabrate. Stems erect, 3–8 dm. tall, solitary or tufted, simple or sparingly branched above: leaves various, the basal often in separate tufts; blades narrowly elliptic, 5–10 cm. long, acute or acuminate at both ends, remotely and shallowly serrate, narrowed into winged petioles, these shorter than the blades; stem leaves, except the lowest, alternate; blades linear-oblong to linear, 3–10 cm. long, acute or acuminate, remotely ser-

rate or nearly entire, sessile by a truncate base : heads showy : involucres somewhat foliaceous : bracts linear-lanceolate or nearly linear, about 1 cm. long : rays deep yellow, linear, 1–2 cm. long, usually 10–12 : disk black, depressed : disk-corollas about 3 mm. long : disk-bracts linear-oblong, acute.

In meadows and dry soils, northwestern Georgia. Summer.

While working under the State Geologist of Georgia in the northwestern and little explored part of that State, I became acquainted with an undescribed species of *Rudbeckia*. The plant was quite common in the limestone districts. *Rudbeckia truncata* differs from *Rudbeckia fulgida* by more elongated basal leaves and the prominently 3-nerved leaf-blades throughout. The blades of the stem leaves, although rather narrow, have a conspicuous truncate base. The heads are larger than those of its relative and the bracts of the involucres more coarsely hirsute.

There is a specimen almost identical with mine in the herbarium of Columbia University [Chapman Herbarium], collected many years ago at Rome, Georgia.

HELIANTHUS VERTICILLATUS.

Perennial, deep green. Stems erect, 9–18 dm. tall, branching above, smooth and glabrous almost to the heads : leaves below the inflorescence in whorls of 3's ; blades firm, broadly linear or linear-lanceolate, 8–12 cm. long, somewhat acuminate, entire, revolute, shagreen-like above, sparsely pubescent beneath, nearly sessile or narrowed into short petioles : peduncles strigillose-hispidulous under the heads : heads showy : involucres campanulate-turbinate, barely 1 cm. high : bracts narrowly linear-lanceolate, ciliolate, otherwise glabrous, somewhat spreading : rays deep yellow, oblong, about 2 cm. long : disks about 1.5 cm. broad : disk-corollas 5 mm. long, triangular-ovate : disk-bracts slightly keeled, pubescent and ciliate at the apex, prolonged into 1 or 2 sharp teeth : achenes about 5 mm. long.

In wet sandy soil, western Tennessee. Summer.

The prolific flora of Tennessee makes it necessary to add another member to the genus *Helianthus*. The specimens in question were collected by Prof. L. M. Bain at Henderson, Tennessee, in August, 1892, no. 288. *Helianthus verticillatus* is related to *Helianthus giganteus*, but is easily distinguished by the smooth and glabrous stem, the narrower entire smoother leaf-blades and the narrowly linear-lanceolate bracts of the involucres.

HELIANTHUS GLAUCUS.

Perennial, deep green. Stems erect, 9–18 dm. tall, widely branching, smooth, glabrous and glaucous: leaves opposite; blades somewhat leathery, firm, lanceolate, acuminate, sharply serrate, very scabrous above, tomentulose beneath, narrowed into short-margined petioles: heads rather small: involucres campanulate, 8–10 mm. high: bracts few, lanceolate or oblong with a lanceolate tip, more or less strongly spreading, white-ciliate: rays yellow, oblong, 1–1.5 cm. long, often 5–7: disk becoming 1 cm. broad: disk-corollas 4 mm. long; segments lanceolate to oblong-lanceolate: disk bracts commonly 3-toothed at the apex, minutely pubescent: achenes 3–3.5 mm. long, oblong-obovoid, with 2 slender barbed teeth.

In dry sandy soil, North Carolina to Georgia and Florida. Summer and fall.

During my collecting trips in various parts of the Southern States I have met with a peculiar species of *Helianthus* for which no provision is made in any of our descriptive works. The species is most closely related to *Helianthus Schweinitzii* from which it differs in the smooth and glaucous stems, the more finely tomentulose lower surfaces of the leaf-blades and the smaller heads and narrower involucres with their broader and shorter bracts, many of these usually recurving about the middle. Typical specimens were collected by the writer on Dunn's Mountain, Rowan County, North Carolina, August, 1894; Stone Mountain and vicinity, Georgia, and on Little Stone Mountain, Georgia, September, 1894.

HELIANTHUS POLYPHYLLUS.

Perennial, deep green. Stems erect, 9–20 dm. tall, branching above, often stout, densely hirsute near the base, glabrous and often smooth above: leaves numerous; blades narrowly linear, 5–16 cm. long, entire, strongly revolute and apparently thick-filiform, curved: heads showy, few or numerous: involucres somewhat foliaceous: bracts linear-subulate, attenuate into subulate tips, about 1 cm. long, some drooping or recurving: rays yellow, narrowly oblong, 1.5–2 cm. long, readily shriveling: disks 1–1.5 cm. broad, depressed: disk-corollas 3 mm. long; segments triangular: disk bracts with a lanceolate or more slender middle tooth and one or more lateral ones: achenes oblong-cuneate, 3 mm. long, striate, glabrous, awnless.

In thickets, Georgia. Fall.

The Stone Mountain district or, probably more correctly, the granite region of Georgia now has its already large endemic flora increased by an additional species of *Helianthus*. The species in question was collected by the writer in thickets along meadows between Stone Mountain and Little Stone Mountain, Georgia, and also near Loganville in the same state, during September 1894. *Helianthus polyphyllus* is related to *Helianthus angustifolius*. Diagnostic characters exist in the stem which is densely hirsute near the base and glabrous above, in the numerous leaves with their very narrow perfectly revolute blades and in the heads, all parts of which are smaller and much more delicate than in the case of *Helianthus angustifolius*.

Bidens Nashii.

Annual, glabrous. Stems erect, 10–20 dm. tall, more or less branched: leaves opposite; blades thickish, oblong to oblanceolate-oblong, 4–10 cm. long, acute, remotely and shallowly serrate, somewhat dilated at the base, sessile, upper slightly connate-perfoliate, somewhat fleshy: heads showy: involucral bracts various, outer foliaceous, linear to spatulate, unequal in length, inner more or less colored, elliptic or oval, shorter than the outer: rays deep yellow, oblong or broadly oblong-obovate, 2–2.5 cm. long: disks 1.5–2 cm. broad: achenes narrowly cuneate, 3.5–4 mm. long, with a few retrorse hairs in margins and two subulate erect awns.

In low grounds, Florida to Louisiana. Summer.

Although the above described species was long ago* recognized as more or less distinct from *Bidens chrysanthemoides* it has never been described under a distinctive name, as far as I can learn. There can be no doubt that it is specifically distinct from other members of the genus *Bidens*. Besides the specimen from Louisiana collected by Dr. Hale and cited by Torrey & Gray, we have good specimens from Florida collected by Dr. Chapman and also by Mr. Nash, no. 2336. From *Bidens chrysanthemoides* it differs in the fleshy and very smooth foliage, the short and broad remotely and hollowly toothed leaf-blades. The heads are larger and the rays usually longer and broader than those of its relative.

*T. & G. Fl. N. A. 2: 353.

MARSHALLIA LACINARIOIDES.

Perennial, somewhat pubescent, 3–4 dm. tall. Stems erect, sparingly branched above, leafy to near top, angled: leaves numerous, alternate, basal and those on lower part of stem 10–20 cm. long, with linear or sometimes broadly linear blades, these attenuate at the ends, prominently 3-nerved, entire, narrowed into margined petioles, other leaves with narrowly linear sessile blades, 1.5–6 cm. long, peduncles 5–9 cm. long, slender: heads small, few-flowered: involucres about 5 mm. high: bracts rigid, linear, attenuate, winged below the middle: corollas 7–8 mm. long, villous; segments linear, nearly as long as the tube.

In the low country, North Carolina to Georgia.

Marshallia lacinarioides makes the fifth species for the genus. It is related to *Marshallia graminifolia*,* but its habit is very suggestive of that of some species of *Lacinaria*, whence the specific name. It may be distinguished by the erect elongated basal leaves with their prominently 3-nerved blades. The campanulate involucres are about one half the size of those of *Marshallia graminifolia* and the heads contain but few flowers.

The original specimens were collected at Macon, Georgia, by Mr. Croom, and in North Carolina [eastern] by Mr. M. O. Curtis.

II. THE NORTH AMERICAN SPECIES OF MELOTHRIA.

That we have three species of *Melothria* instead of one in Florida is very evident from material in Mr. Nash's rich collections. So far as I can learn the first and second species following the appended key have never before been described. According to the collector they are native and very plentiful where found.

MELOTHRIA L. Sp. Pl. 35. 1753.

Key to the Species.

Berries globose. 1. *M. Nashii.*

Berries oblong or oval.

Stems trailing and creeping; leaves broader than long, the lobes low and rounded. 2. *M. crassifolia.*

Stems climbing; leaves longer than broad, the lobes angular. 3. *M. pendula.*

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* *Athanasia graminifolia* Walt. Fl. Car. 201. 1788.
Persoonia angustifolia Michx. Fl. Bor. Am. 2: 104. 1803.
Marshallia angustifolia Pursh. Fl. Am. Sept. 520. 1814.

1. MELOTHRIA NASHII.

Perennial, slender, rough-pubescent. Stems trailing and creeping, 3–12 dm. long, branched, angled: leaves fleshy, suborbicular or triangular-ovate in outline, 2–3.5 cm. broad, usually 5-lobed, very rough on the surfaces, the lobes entire or with 1–2 teeth or small lobes; petioles hispid, about as long as the blades: flowers monoecious, the sterile in long-peduncled corymbs, the fertile on solitary long peduncles: calyx campanulate, minutely hispid; teeth triangular, acute, several times shorter than the tube: corolla-segments longer and narrower than the calyx-teeth: stamens included; anthers pubescent at the tips, nearly sessile: berries globose, 12–15 mm. in diameter, their peduncles about 3 cm. long.

In sandy soil about Tampa, Florida. *Nash*, no. 2469.

2. MELOTHRIA CRASSIFOLIA.

Perennial, with tuberous-thickened roots, rough-pubescent. Stems trailing and creeping, 6–15 dm. long, branched throughout, angled, sparingly pubescent: leaves thick and fleshy, reniform or orbicular-reniform, 2–4 cm. broad, usually with 5 rounded obtuse lobes, which are undulate or shallowly toothed, cordate, the sinus closed or nearly closed; petioles hispid, about as long as the blades: flowers monoecious, the sterile in long-peduncled racemes, the fertile solitary on long peduncles: calyx campanulate, minutely hispid; teeth triangular-ovate, much shorter than the tube, acute: anthers glabrous, nearly sessile: berries oblong, 1.5–2 cm. long.

In moist places about Eustis, Florida. *Nash*, no. 865.

3. MELOTHRIA PENDULA L. Sp. Pl. 35. 1753.

Annual or perennial, slender, sparingly pubescent. Stems high-climbing, branched: leaves thin, drying membranous, suborbicular or ovate in outline, 3–8 cm. broad, with 3–5 angular usually shallowly toothed lobes, both surfaces pubescent with short hairs, cordate, the sinuses open; petioles 1–3.5 cm. long, hispid: flowers monoecious; sterile racemed; fertile solitary, the peduncles about as long as the petioles: calyx glabrous or puberulent, 2 mm. long; tube campanulate, teeth very short: corolla yellow or greenish-white, 3–4 mm. broad, pubescent without, the segments ovate or obovate: berries oblong or oval, 10–25 mm. long, pendulous, dark-purple or blackish: seeds obovoid, 3.5–4 mm. long, flattened.

In swamps and light soil, Pennsylvania to Missouri, south to Florida, Texas, and Mexico.

The three following forms have been segregated as varieties of *Melothria pendula* by Prof. Cogniaux* but they are imperfectly known. When better understood, two of them, and probably all three, will prove to be distinct species.

The appended descriptions and data are mostly taken from Prof. Cogniaux's monograph.*

3a. MELOTHRIA PENDULA CHLOROCARPA (Engelm.) Cogn. in DC. Monog. Phaner. **3**: 587. 1881.

Melothria chlorocarpa Engelm.; S. Wats. Bibl. Ind. 395. 1878.

Fruit yellow, 1.5 cm. long, 1 cm. thick: seeds 5–5.5 mm. long, 3 mm. broad.

In eastern Texas (El. Hall. no. 230. in herb. Boiss.).

3b. MELOTHRIA PENDULA ASPERA Cogn. in DC. Monog. Phaner. **3**: 587. 1881.

Petioles hirsute: leaves 2–3 cm. long and broad, very scabrous on both sides, deeply lobed, lobes oblong, sometimes wholly entire, obtuse; nerves hirsute beneath: fruit and seeds as in the species.

In Florida, along fields near lake Jamony (Rugel in herb. DC.)

3c. MELOTHRIA PENDULA MICROCARPA Cogn. in DC. Monog. Phaner. **3**: 587. 1881.

Stem creeping, filiform: petioles filiform, 1–3 cm. long: leaves slightly lobed, 1.5–3 cm. long and broad, scabrous on both sides: fruit subglobose, 7–8 mm. thick.

In Alabama, Muscle Shoals, Tennessee River (Rugel in herb. Shuttleworth now Brit. Mus., DC., Boiss.).

* DC. Monog. Phaner. **3**: 325–954.

The Flora of the Lower Susquehanna.

By Thos. Conrad Porter.

(With Map, Plate 349.)

Whilst residing in the city of Lancaster, from the year 1853 to 1866, I did a great deal of botanical exploration along the valley of the Lower Susquehanna, passing over much of the ground visited by Muhlenberg half a century before. The rarer pteridophytes and anthophytes then and there observed and collected are comprised in the following list, with a few additions of a later date.

As an introduction, a brief sketch of the field is given, accompanied by a map, in which the figures appended to the stations indicate their elevation in feet above the sea level.

Below Duncan's Island, where it receives the waters of the Juniata from the west, the general course of the river is southeasterly, and the distance from that point to the Maryland line, measured as the crow flies, about 70 miles. In breadth it varies from two miles to less than one, the average being one. At the cañon-like gorge above McCall's Ferry the channel is very deep and narrow, apparently not more than one hundred yards across. The wider portions of the stream are characterized by an abundance of islands, large and small, some of them under cultivation and others bare or covered with shrubs and trees. Many of them are completely submerged during high freshets. When the summers are hot and dry for a long period the waters become very low, forming, where the fall is not great, extensive, sluggish shallows that furnish excellent nurseries for aquatic plants.

Starting at Duncannon, in Perry County, and going southward, the stations cited in the list succeed each other thus (the number of miles apart being expressed by the figures): To Marysville, 7; Railroad bridge, 2; Harrisburg, 4; Falmouth, 13; Collins' Ferry, 3; Marietta, 8; Chickies, 1; Columbia, 2; Washington Manor, 5: Turkey Hill, 3; Safe Harbor, 2; mouth of the Pequea, 2; Reed's Run, 3; mouth of the Tucquan, 2; Peach Bottom, 10; Maryland Line, 3.

In the first section of the route from Duncannon, the river flows majestically through a mighty gap in the Blue Mountain and its parallel ranges. On the east side of it lies Dauphin County and on the west Perry, south of which Cumberland is reached and then York lower down. Below Dauphin comes Lancaster, and these two counties have their western boundaries at low-water mark on the opposite shores, so that all the islands are included in their territorial limits.

At Falmouth the river enters the region of the South Mountain system, and along its whole course down to the Maryland line is bordered by bold bluffs and high ridges, intersected by numerous ravines.

The conditions here described are all favorable to a rich and diversified flora, and such it, indeed, is. The denizens of the mountains and the interior find pathways toward the sea. For whilst not a few of the plants enumerated have crept up from lower levels, a greater number appear to have come down from higher altitudes, or from the remote western sources of the mighty river. About thirty species of the list belong naturally to the region beyond the Alleghenies, through which the west branch of the Susquehanna finds a passage, drawing its first waters from almost the same levels as streams that descend into the basin of the Ohio. On the other hand, about twenty seem to have been conveyed down from the elevated mountain-plateaus, drained by the tributaries of the North Branch.

LIST OF SPECIES AND THEIR STATIONS.

PTERIDOPHYTA.

1. *Onoclea Struthiopteris* Hoffm. Islands, near Harrisburg and Safe Harbor; McCall's Ferry.

2. *Asplenium angustifolium* Michx. York County, opposite Marietta; Turkey Hill.

3. *Asplenium montanum* Willd. York County, opposite Marietta; ravine at York Furnace; mouth of the Tucquan. On rocks.

4. *Asplenium pinnatifidum* Nutt. Ravine at York Furnace and on rocks above the mouth of the Tucquan.

5. *Asplenium Bradleyi* D. C. Eaton. On rocks, above the mouth of the Tucquan, *Small.*

6. *Cheilanthes lanosa* (Michx.) Watt. On rocks, Safe Harbor and McCall's Ferry.

7. *Equisetum littorale* Kuehlewein. Forster's Island, at Harrisburg, and the island at Safe Harbor. Occurs higher up, on the North Branch. A northern species.

8. *Equisetum fluviatile* L. Islands at Safe Harbor. A mountain species.

9. *Equisetum sylvaticum* L. York County, opposite Marietta; Turkey Hill. Rare.

ANTHOPHYTA.

10. *Pinus Strobus* L. On a large, high, wooded island, at McCall's Ferry.

11. *Pinus pungens* Michx. On the mountain-side, at McCall's Ferry, *Heller.*

12. *Potamogeton zosteraefolius* Schum. Collins' Ferry.

13. *Potamogeton pectinatus* L. Safe Harbor.

14. *Potamogeton lonchites* Tuckerm. Safe Harbor.

15. *Potamogeton Robbinsii* Oakes. Safe Harbor.

16. *Tripsacum dactyloides* L. Safe Harbor; Tucquan Island.

17. *Panicum polyanthes* Schultes (*P. microcarpon* Muhl.) Marysville; Tucquan Island. Rare.

18. *Zizania aquatica* L. Abundant in a large pond above Marietta, where it is visited by reed birds and rail.

19. *Muhlenbergia capillaris* Kunth. Safe Harbor. The only known station in Pennnsylvania.

20. *Sporobolus heterolepis* A. Gr. Peach Bottom, *J. J. Carter.*

21. *Spartina cynosuroides* (L.) Willd. Harrisburg; Collins' Ferry; mouth of the Tucquan.

22. *Eragrostis Frankii* Meyer. On sandy flats, below the mouth of the Pequea.

23. *Eatonia obtusata* (Michx.) A. Gray. Safe Harbor.

24. *Melica mutica* Walt. Safe Harbor. Also on the Schuylkill, at Reading.

25. *Panicularia elongata* (Torr.) Ktze. On Reed's Run. A mountain species.

26. *Uniola latifolia* Michx. Safe Harbor; McCall's Ferry.

27. *Cyperus erythrorhizos* Muhl. Harrisburg, on the islands; Tucquan Island.

28. *Cyperus Lancastriensis* Porter. Safe Harbor; Tucquan; McCall's Ferry.

This is most likely the *Scirpus retrofractus* of Muhlenberg, at least in part.

29. *Cyperus strigosus compositus* Britton. Safe Harbor.

30. *Scirpus fluviatilis* A. Gray. Peach Bottom, *Dr. George Smith.*

31. *Rynchospora cymosa* Nutt. Tucquan Island.

32. *Carex Frankii* Kunth. York Furnace, *J. Crawford.* A specimen or two only found, as also in the streets of West Chester. Occurs in Huntingdon County and west of the Alleghenies.

33. *Carex Shortiana* Dewey. Near Falmouth, *Small.* Very rare. Occurs in Franklin County, near Mercersburg and more common west of the Alleghenies.

34. *Commelina hirtella* Vahl. Above the mouth of the Tucquan; Peach Bottom.

35. *Commelina Virginica* L. Safe Harbor.

36. *Pontederia cordata* L. York County, above Wrightsville; Islands at Safe Harbor.

37. *Heteranthera reniformis* Ruiz & Pavon. York County, above Wrightsville and opposite Safe Harbor.

38. *Stenanthium robustum* S. Watson. Below Peach Bottom, *J. J. Carter.* Also in Clarion County, west of the Alleghenies, *Garber.*

39. *Allium cernuum* Roth. Mouth of the Tucquan.

40. *Erythronium albidum* Nutt. Island, above Harrisburg, *Small;* Turkey Hill, *Garber.*

41. *Trillium grandiflorum* (Michx.) Salisb. Below Peach Bottom, *J. J. Carter.*

42. *Iris verna* L. Below Peach Bottom, *J. J. Carter.*

43. *Habenaria peramoena* A. Gray. Mouth of the Pequea.

44. *Salix lucida* Muhl. Washington Manor, Lancaster County.

45. *Salix fluviatilis* Nutt. York County, above McCall's Ferry. With leaves an inch broad!

46. *Rumex altissimus* Wood. Island at Safe Harbor. It also occurs in Crawford County, west of the Alleghenies.

47. *Polygonum cilinode* Michx. Above Marysville, Perry County. Brought down from the mountain plateaus, where it is common.

48. *Polygonum incarnatum* Ell. Harrisburg; Safe Harbor; Peach Bottom.

49. *Silene alba* Muhl. Safe Harbor; Mouth of the Tucquan; McCall's Ferry. Common on the islands, where Muhlenburg, no doubt, gathered his first specimens. It belongs west of the Alleghenies and occurs in Armstrong County, Pa.

50. *Sagina apetala* L. Safe Harbor.

51. *Tissa rubra* (L.) Britt. Harrisburg; Safe Harbor.

52. *Nymphaea microphylla* Pers. Collins' Ferry. Brought down from the mountain plateaus.

53. *Magnolia tripetala* L. York County in the ravine back of York Furnace and along the river shore. Also in the ravine at Reed's Run, on the opposite side of the river. Local and not abundant.

54. *Asimina triloba* (L.) Dunal. Common along the river and its tributaries. It is found also on the Juniata and in Huntingdon County at an elevation of 1,400 feet.

55. *Ranunculus Pennsylvanicus* L. f. Chickies.

56. *Cardamine hirsuta* L. York County, opposite Marietta, *Small.*

57. *Cardamine arenicola* Britt. Safe Harbor, *Small.*

58. *Cardamine purpurea* (Torr.) Britt. York shore, opposite Chickies.

59. *Arabis laevigata Burkii* Porter. Duncannon; Harrisburg.

60. *Cheiranthus turritoides* Lam. (*Erysimum cheiranthoides* L.). Harrisburg and Safe Harbor, on the islands.

61. *Polanisia graveolens* Raf. Flats along the river's edge. Common.

62. *Sedum ternatum* Michx. Safe Harbor. Found also on the Juniata and in the western part of the state.

63. *Heuchera pubescens* Pursh. Duncannon; Safe Harbor. On rocky bluffs. Common on the Juniata.

64. *Itea Virginica* L. Collected at one point only, in Cumberland County, by McMinn.

65. *Rubus strigosus* Michx. Collins' Ferry. Abundant on the mountains further north.

66. *Rubus Baileyanus* Britton. Above Chickies, *Small.*

67. *Rubus cuneifolius* Pursh. Peach Bottom.

68. *Potentilla arguta* Pursh. Safe Harbor. Rare. A northern species.

69. *Ulmaria rubra* Hill. New Texas, *J. J. Carter.* A western species.

70. *Rosa blanda* Ait. Marysville, Perry county; McCall's Ferry, *Heller.*

71. *Robinia Pseudacacia* L. Frequent along the shores, especially in York county, where it appears to be native, the progeny of seeds brought down from the Juniata.

72. *Crotolaria sagittalis* L. Collins' Ferry, Tucquan Island.

73. *Meibomia sessilifolia* (Torr.) Ktze. Mouth of Reed's Run.

74. *Lathyrus venosus* Muhl. Duncannon, *Garber*; York Furnace, *Brinton.*

75. *Strophostyles helvola* (L.) Britt. Collins' Ferry; Tucquan; McCall's Ferry; New Texas.

76. *Geranium columbinum* L. Safe Harbor.

77. *Phyllanthus Carolinensis* Walt. York county, above Wrightsville; McCall's Ferry.

78. *Euphorbia commutata* Engelm. Safe Harbor.

79. *Ilex opaca* Ait. Mouth of the Tucquan: McCall's Ferry. It occurs also higher up the river, at Cold Spring, some miles east of Dauphin.

80. *Euonymus Americanus* L. Peach Bottom.

81. *Acer spicatum* Lam. York County, opposite Safe Harbor. A mountain species.

82. *Vitis rupestris* Scheele. Harrisburg: Collins' Ferry.

83. *Sida hermaphrodita* (L.) Rusby. York County, Lockport, opposite Safe Harbor, the only station known in Pennsylvania. It has held its own there for many years, but does not spread much.

84. *Hibiscus Moscheutos* L. Harrisburg, Wetzel's Swamp; Collins' Ferry. Rare.

85. *Hibiscus militaris* Cav. Safe Harbor; Tucquan. On the islands, near the water.

86. *Ascyrum hypericoides* L. Tucquan Island; McCall's Ferry.

87. *Hypericum Ascyron* L. Harrisburg, on the islands, *Small.*

88. *Hypericum prolificum* L. Frequent along the river shores.

89. *Hypericum ellipticum* Hook. Safe Harbor.

90. *Viola rotundifolia* Michx. York County, opposite Safe Harbor. A mountain species.

91. *Viola villosa* Walt. York Furnace, *J. Crawford.*

92. *Passiflora lutea* L. Safe Harbor; Tucquan Island. Also west of the Alleghenies.

93. *Opuntia Opuntia* (L.) Coulter. Peach Bottom. It occupies a space of several yards square, near the top of a rocky hill, at the head of a large island and is found also in a similar habitat at the Delaware Water Gap.

94. *Rotala ramosior* (L.) Koehne. Chickies and the York County shore opposite, and further down.

95. *Kneiffia linearis* (Michx.) Small. Mouth of the Tucquan.

96. *Proserpinaca palustris* L. Harrisburg.

97. *Myriophyllum spicatum* L. In the river at Harrisburg.

98. *Oxytropis rigida* (L.) Britt. Harrisburg, on the islands.

99. *Cicuta bulbifera* L. Collins' Ferry.

100. *Hydrocotyle ranunculoides* L. f. York County, above Wrightsville; Harrisburg; Collins' Ferry.

101. *Erigenia bulbosa* Nutt. York County, above Wrightsville. A western species.

102. *Azalea arborescens* Pursh. Marysville, Perry County, *Small*; Tucquan Island, where I found in 1864, under a large overhanging rock, a small bush of it bearing a profusion of fragrant, snow-white blossoms.

103. *Rhododendron maximum* L. McCall's Ferry. Abundant in all the large ravines along the river.

104. *Picris Mariana* Benth. & Hook. Below Peach Bottom.

105. *Lysimachia vulgaris* L. York Furnace, *Brinton.*

106. *Dodecatheon Meadia* L. Duncannon, *Garber*; Bridgeport, opposite Harrisburg; Safe Harbor. Also on the Conestoga, near Lancaster.

107. *Diospyros Virginiana* L. Common on the banks and islands all along the lower part of the river, sometimes producing an abundance of fruit when a shrub but a few feet high.

108. *Chionanthus Virginica* L. York Furnace; Peach Bottom. Also higher up the river.

109. *Vincetoxicum obliquum* (Jacq.) Britt. Safe Harbor; Tucquan Island. Rare.

110. *Ipomaea lacunosa* L. Safe Harbor; Tucquan Island; Peach Bottom.

111. *Cuscuta Cephalanthi* Engelm. Harrisburg, on the islands; above Marietta; Safe Harbor.

112. *Cuscuta Polygonorum* Engelm. Harrisburg, on the islands; above Marietta; Safe Harbor.

113. *Phlox paniculata* L. Below the mouth of the Pequea. Probably not escaped from culture.

114. *Hydrophyllum Canadense* L. Turkey Hill, above Safe Harbor; Peach Bottom, on a high hill at the head of an island. A northern species.

115. *Microcalyx Nyctelea* (L.) Ktze. Duncannon; Marietta; Safe Harbor.

116. *Phacelia dubia* (L.) Small. Duncannon; Safe Harbor; Tucquan.

117. *Phacelia Purshii* Buckley. Safe Harbor. A western species.

118. *Physostegia denticulata* (Ait.) Britt. Harrisburg; Safe Harbor; Peach Bottom.

119. *Gerardia Skinneriana* Wood. Below Peach Bottom. *J. J. Carter.*

120. *Catalpa Catalpa* (L.) Karst. Not infrequent along the river. May have escaped from culture.

121. *Ruellia strepens* L. Safe Harbor.

122. *Lippia lanceolata* (Ait.) Britt. Harrisburg; Safe Harbor; Peach Bottom.

123. *Dianthera Americana* L. Very abundant, and acres of it in the shallows of the river north of the railroad bridge above Harrisburg, where it nourishes large beds of *Cuscuta Gronovii*, whose vivid orange color attracts the notice of travelers crossing in the cars during the months of August and September.

124. *Diodia teres* Walt. Chickies; Peach Bottom.

125. *Micrampelis lobata* (Michx.) Greene. Islands below Harrisburg.

126. *Sambucus pubens* (Michx.) Chickies. York County, opposite Safe Harbor. A mountain species.

127. *Elephantopus Carolinianus* L. Below Peach Bottom.

128. *Eupatorium rotundifolium* L. Island at McCall's Ferry.

129. *Eupatorium hyssopifolium* L. Collins' Ferry; McCall's Ferry.

130. *Eupatorium Torreyanum* Short. Collins' Ferry.

131. *Eupatorium coelestinum* L. Safe Harbor.

132. *Willoughbya scandens* (L.) Ktze. Mouth of the Pequea.

133. *Chrysopsis Mariana* (L.) Nutt. Peach Bottom.

134. *Solidago puberula* Nutt. York County, opposite Marietta. Probably brought down from the mountain-plateaus of Luzerne County where it and the following species abound.

135. *Solidago odora* Ait. Tucquan Island; McCall's Ferry.

136. *Solidago Canadensis glabrata* Porter. Below the mouth of the Tucquan, *Small.*

137. *Solidago Purshii* Porter. McCall's Ferry, on the York County shore, where it was discovered by me in 1864. It grows near the river's edge on rocks, subject to inundation and in similar habitats elsewhere—on Onion River, Vermont, at the Great Falls of the Potomac and on the Yadkin River, North Carolina.

138. *Boltonia asteroides* L'Her. Harrisburg, on the islands; Collins' Ferry; Safe Harbor; mouth of the Tucquan. Common on rocks near the water's edge.

139. *Aster Pringlei* Britt. On the river flats near Harrisburg; Safe Harbor; mouth of the Tucquan.

140. *Aster multiflorus* Ait. Safe Harbor.

141. *Baccharis halimifolia* L. Below Peach Bottom. *J. J. Carter.*

142. *Polymnia Canadensis* L. York county, opposite Marietta; Safe Harbor.

143. *Polymnia Uvedalia* L. Turkey Hill; Tucquan Island.

144. *Silphium trifoliatum* L. McCall's Ferry, *Garber.* A western species.

145. *Chrysogonum Virginianum* L. Below Peach Bottom, *J. J. Carter.*

146. *Eclipta alba* (L). Hassk. Harrisburg; Chickies; Safe Harbor; on the river flats.

147. *Helianthus tuberosus* L. Safe Harbor. Common along the river, where it is undoubtedly native. When escaped from cultivation, as is sometimes the case, the escape is easily distinguished by the practised eye.

148. *Verbesina alternifolia* (L.) Britt. Harrisburg. Common and abundant along the river and along its smaller tributaries.

148. *Coreopsis tripteris* L. Marysville; mouth of the Tucquan. A western species.

150. *Mesadenia reniformis* (Muhl.) Raf. Tucquan Island. It occurs also on the Juniata.

151. *Synosma suaveolens* (L.) Raf. Below the mouth of the Pequea. Also in the counties west of the Alleghenies.

152. *Arnica acaulis* (Walt.) B.S.P. Below Peach Bottom, *J. J. Carter.*

153. *Carduus nutans* L. Harrisburg.

Specimens of all the plants from the stations named in this list are contained in the Pennsylvania Herbarium of Lafayette College.

An Enumeration of the Plants collected by Dr. H. H. Rusby in South America, 1885–1886.—XXIV.

By H. H. Rusby.

(Continued from the last contribution by Dr. N. L. Britton, Bull. Torr. Bot. Club, **20**: 140. 1893.)

Note.—Soon after the publication of the last part of this Enumeration, in 1893, Dr. Britton became so engrossed in the important duties which have since culminated in the publication of the Illustrated Flora, and in the establishment of the New York Botanical Garden, that the continuation of this work was impossible. Up to a recent period, Dr. Britton hoped to resume the publication, but, seeing now that this is impracticable, he has asked the present writer to undertake the completion of the task. The succeeding parts will be published in the Bulletin from month to month, as regularly as the circumstances will permit. Meanwhile, the MS. for the Enumeration of the remaining plants of Mr. Bang's collections is being prepared coincidently and will shortly form a part of the *Memoirs*.

APOCYNACEAE.

Rauwolfia ternifolia H.B.K. Nov. Gen. et Sp. **3**: 232. Junction of Rivers Beni and Madre de Dios, Aug., 1886. A shrub. (Nos. 2388 and 2389).

Aspidosperma ramiflorum Muell. Arg. in Mart. Fl. Bras. **6**[1]: 55. (*Fide* Britton.) Guanai, 2000 ft., May, 1886 (no. 2649).

Tabernaemontana laeta Mart. Flora **20**: Beibl. 98. 1837. Junc. of Rivers Beni and Madre de Dios, Aug., 1886 (nos. 929?, 930 and 2378).

Tabernaemontana undulata Vahl. Eclog. Am. **2**: 20. Falls of Madeira, Brazil, Oct., 1886 (no. 2396). The same as Holton's no. 445 from New Granada.

Stemmadenia mollis Benth. Bot. Voy. Sulph. 125. Guayaquil, Ecuador, Feb., 1895 (no. 931).

Forsteronia pubescens A. DC. Prod. **8**: 436.

Junction of Rivers Beni and Madre de Dios, Aug., 1886 (no. 2526).

Secondatia densiflora A. DC. Prod. **8**: 445. (*Fide* Britton.) Falls of Madeira, Brazil, Oct., 1886 (no. 2392).

Laubertia sp. (?), Beni River, July, 1886 (no. 2599).

This curious specimen, which Dr. Britton thought might belong to *Condylocarpon*, to me presents the aspect of a *Laubertia*; but it is in fruit and the fruit of *Laubertia* is not known.

Echites brachyloba Miers, Apocyn. S. Am. 203 (*Amblyanthera brachyloba* Muell. Arg. Linnaea, **30**: 423. 1859–60). Mapiri, 2500 ft., May, 1886 (no. 2585). The same as Mathew's no. 820.

Echites sps. Nos. 2383, 2390 and 2393 belong to this genus, but none are in a fit state for a positive determination. The first may be a form of *E. trifida* Jacq.

Dipladenia, species apparently undescribed. Reis, Bolivia, 1500 ft., June, 1886 (no. 2694).

MANDEVILLA BOLIVIANA (Britton). (*Echites Boliviana* Britton ex Rusby, Mem. Torr. Bot. Club, **4**: 219). Guanai, 2000 ft., May, 1886 (no. 2380), Yungas, 4000 ft. (no. 2381) and Mapiri, 5000 ft., April, 1886 (no. 2382). The type is Bang's no. 1687.

MANDEVILLA MANDONI sp. nov.

Glabrous, except the lower leaf-surfaces: branches terete, slender, purple, the internodes 1–1.5 dm. long: petioles 1–1.5 cm. long, stoutish, purple; blades 8–10 cm. long, 4–6 cm. broad, cordate, abruptly acuminate and very acute, finely soft-tomentose and finely reticulate underneath, the venation not prominent: peduncle pseudo-axillary, 1 dm. long, stoutish; the raceme loose, about 8–15-flowered; pedicels about 2.5 cm. long, the bracts 5–7 mm. long, subulate, weak, deciduous: calyx 1 cm. long, cleft to the base, the segments narrow, tapering from the base to an acute point: corolla hypocrateriform, the tube nearly cylindrical, 2.5–3 cm. long, 5 mm. broad, as pressed, the limb imperfect in the specimen, apparently 2–2.5 cm. broad.

Sorata, 8000 ft., Feb., 1886 (no. 2386). Very near *M. Bangii*, but the form, texture and indumentum of the leaves is quite distinct. Dr. Britton thinks it identical with Mandon's no. 1472, which I have not seen.

Nos. 2379 and 2394 are apparently in this genus, but are unfit for diagnosis.

ASCLEPIADACEAE.

Mitostigma niveum Griseb. in Goett. Abhand. **24** : 226. 1879. Sorata, 8000 ft., Feb., 1886 (no. 2517).

Dr. Britton finds this plant to be the same as Mandon's no. 357, which is thus named by Grisebach.

Mitostigma sp. (?) Material for dissection is wanting. Guanai, 2000 ft., May, 1886 (no. 2544).

Amblyostigma pedunculare Benth. Hook. Icon. Pl. **12** : 77. Mapiri, 2500 ft. May, 1886 (no. 1048). According to Miss Vail, this is the same as Mandon's no. 352, on which the species was founded.

Oxystelma solanoides (H.B.K.) K. Schum, in Eng. & Prantl Nat. Pfl. Fam. 4^2 : 229. (*Philibertia solanoides* H.B.K. Nov. Gen. et Sp. **3** : 197. *pl. 230.*) Yungas, 4000 ft. 1885 (no. 1973). The same as Bang's no. 1815.

Fischeria Martiana Decaisne in DC. Prod. **8** : 601, Beni River, July, 1886 (no. 936).

Gothofreda Dombeyana (Decaisne) Kuntze Rev. Gen. Pl. 420 (*Oxypetalum Dombeyanum* Decaisne in DC. Prod. **8** : 583) Guanai, 2000 ft., May, 1886 (no. 934). The same as Bang's no. 1395.

Asclepias nervosa Decaisne in DC. Prod. **8** : 568. (*Fide* Dr. Britton.) Yungas, 6000 ft., 1885 (no. 935).

METASTELMA (EUMETASTELMA) MATHEWSII sp. nov.

Branches twining, elongated, slender, sparingly puberulent toward the tip, green, terete, the internodes extremely variable in length : petioles slender, 1 cm. or less long, flattened or slightly channelled above, sparingly puberulent ; blades 2.5–6 cm. long, 1–2 cm. broad, lance-oblong, the base obtuse to rounded, the apex aristate, glabrous or sparingly short-pilose when young, deep green, the midrib stout and very prominent underneath, the primaries 10–12 unequal pairs, interconnecting two thirds of the way to the margin : inflorescence pubescent ; peduncles mostly less than 5 mm. long, weak : flowers umbellate, 3–8, the pedicels minutely short-bracted at the base, about as long as the peduncle and similar to it : calyx 2–3 mm. broad, divided more than half way, the lobes broadly ovate, acute, green with broad hyaline margins : corolla greenish-white, open, campanulate, divided three fourths of the way to the base, the lobes 3 mm. long, 1.5 mm. broad, tri-

angular-ovate, somewhat obtuse ; gynostegium 2 mm. long, 1 mm. broad, nearly sessile ; crown of 5 slender, subulate, white, strongly incurved teeth, lightly adnate to the base of the stamen column: caudae of the anthers whitish, corneous, acute, projecting, nearly as long as the body ; apical appendages hyaline, erect, about equaling the stigma ; corpuscles dark brown, erect, ellipsoidal or slightly broader above, about half the size of the pollinia, which are pendulous on nearly horizontal thick arms, obovoid, compressed: stigmatic disk slightly convex.

Yungas, 6000 ft., 1885 (no. 2543).

The species appears externally the same as Mathew's no. 3144 from Chachapoya, though less puberulent. It is, by dissection, the same as Bang's no. 2090.

TASSADIA SPRUCEI sp. nov.

(Only a short terminal portion of a flowering branchlet seen.) Subglabrous, only the youngest portions of the slender stems minutely puberulent: petioles 5–8 mm. long ; blades 3.5 cm. or more long, 1.5 cm. or more broad, ovate, the base rounded, the apex abruptly short-acuminate, the obtuse point short-aristate, margin thinly revolute, thick, coriaceous, midrib and 3 or 4 pairs of primaries prominent underneath: racemes axillary, slender, nearly 1 dm. long, the peduncle ⅓–½ of the length: the flowers in sessile umbellules of 3–5, sub-pendulous on slender pedicels about 2 mm. long: calyx 1.5 mm. broad, divided more than half way, the lobes ovate, acutish, thick, purple (?) with lighter margins: corolla very broadly campanulate, 3 or 4 mm. broad, purple, thick, the lobes about two-thirds the length, ovate, obtuse, the tips spreading or slightly recurved. Material for dissection wanting.

Falls of Madeira, Brazil, Oct., 1886 (no. 2573). The same as Spruce's no. 3295.

DITASSA RACEMOSA Britton sp. nov.

Glabrous, the branches terete, much elongated and very slender, the internodes 3–6 cm. or more long: petioles 5–7 mm. long, stoutish, flattened, recurved ; blades 3.6 cm. long, .5–1 cm. broad, lanceolate, slightly inequilateral, the base rounded to slightly cordate, the apex acuminate and acute, dark green, the venation not prominent, much reticulate: racemes 1 to nearly 2 dm. long, occasionally sparsely branched, very slender, pendulous, the flowers mostly solitary, .5–1 cm. apart, the pedicels bracted at the base,

about 5 mm. long, strongly curved; bracts about 5 mm. long, ovate, thickish: calyx 3 mm. broad, lobed nearly to the base, the lobes narrowly ovate, obtuse or minutely apiculate: corolla white, coarsely pilose at the base within, 6 mm. broad, lobed two thirds of the way, the lobes ovate, obtuse: outer crown adnate to the base of the filaments, of 5 lanceolate, long-acuminate, concave, whitish, thin and delicate ligules, which are 3 mm. long, erect, recurved, and the apex again erect: the inner more highly adnate, less than half as long, of 5 rigid broad scales, bearing a narrow short apical appendage: gynostegium nearly sessile, broader above: apical anther appendage hyaline, delicate, very broadly ovate, erect: corpuscles not appendaged, broadly ovoid, obtuse, erect, the pollinia ovoid; lightly compressed, pendulous, on nearly horizontal slender caudiculae: stigmatic disk .5 mm. broad, convex, fleshy-thickened.

Yungas, 4000 ft., 1885 (no. 2546). The same as Bang's nos. 2140 and 2845. Also collected by Pearce at Coroico, 5000–6000 ft., Feb., 1886.

Ditassa aristata Benth. ex Fourn. in Mart. Fl. Bras. **6**[4]: 247. (*Fide* Britton). Mapiri, 2500 ft., May, 1886 (no. 1046).

VINCETOXICUM UNGUICULATUM (R. & P.) Britton.

(*Cynanchum unguiculatum* R. & P. in Herb. Kew.)

Roughish-pubescent throughout, the hairs of the stem retrorse: stems stoutish, twining, much-branched, green, the internodes 1.5–4 cm. long: petioles 3–7 mm. long, broad and stout; blades 2–4 cm. long, 1–1.5 cm. broad, ovate, the base rounded, the apex short-acuminate and acute, thick (and fleshy?), substrigose above, the hairs upon the veins underneath much longer and coarse: flowers densely clustered in the axils, the stout pedicels at length (and in fruit) 7 mm. long: calyx 3 mm. broad, divided two-thirds of the way, the lobes narrowly ovate, acuminate and acute, the sinuses broad, thick, brown: corolla 5 mm. broad, sub-rotate, densely pilose within, white, divided two-thirds of the way, the lobes ovate, obtusish; crown adnate only to base of filaments, nearly as long as the gynostegium, single, of 5 erect lobes which are broader than long, penicillate at the apex, keeled, the edges of the two adjacent meeting and turned outward, rigid: pollinia small, but little larger than the brownish corpuscle: fruit 6 cm. long, narrowly lanceolate and acuminate, smooth.

Unduavi, 8000 ft., Oct., 1885 (no. 1044) and Yungas, 4000 ft., (no. 2518).

GONOLOBUS BRITTONII sp. nov.

Pubescent throughout, the branches terete, elongated, slender, twining: petioles 1.5–2 cm. long, slender; blades 2.5–5 cm. long, 1–2 cm. broad, ovate, the base cordate-truncate, the apex abruptly short-acuminate, acutish, strigose, subferruginous on the veins underneath: umbels about 5-flowered, on peduncles about 1 cm. long; pedicels very unequal, the longest about 1 cm. long, about the same in fruit: calyx-tube very short, saucer-shaped, the lobes 2 mm. long, ovate, obtuse: corolla subrotate, 8 mm. broad, divided more than half way, very veiny, the lobes ovate, obtusish; outer crown 2 mm. broad, adnate to the base of the corolla except for a short free annulus, light-colored; inner crown shorter, of 5 ovate thick scales, adnate at the base to the outer: stigmatic disk plane, the center minutely elevated, thin, 2 mm. broad exclusive of its appendages, its 5 dark grooves terminating at the margin in minutely recurved tooth-like points, these connected by slightly elevated, sharp, light-colored ridges which form the bases of triangular lobes, twice as broad as long, each terminating in a transversely elliptical appendage about .5 mm. broad: pod broadly ovoid, inequilateral, obtuse (?) smooth, nearly 1 dm. long.

Mapiri, 2500 ft., May, 1886 (no. 1045).

The species differs from *G. parviflorus* Decaisne in having peduncles shorter than the petioles, and the corolla not barbellate within.

VAILIA gen. nov. (Marsdenieae).

Calyx 5-lobed, its glands wanting or indistinguishable, the segments obtuse. Corolla broadly campanulate, deeply 5-lobed, glabrous, the lobes obtuse. Crown adnate only to stamen-column, of 5 scales, each of an outer and an inner ligule, the two adnate by their margins at the base to form a pouch: the outer ligule inwardly concave, free, except the margins at the base; the inner ligule outwardly concave, the lower half, except the margins, adnate to the stamen-tubes, the upper half free. Anthers with stout, obtuse, rigid, empty basal portions adnate to one another, except at the very base, and to the tube, constituting more than half their length, their hyaline apical appendages very small, strongly inflexed, broad, slightly exceeding the disk of the stigma; lateral hyaline appendages also present upon the inner face; thecae rupturing transversely on the inner face. Pollinia solitary, large, marked in the unopened anther by large external protuberances, strictly erect, quite as high as the stigmatic margin, broadly ellipsoidal, their uppermost portions higher than the oblong, unappendaged corpuscle, the caudiculae somewhat thickened, regularly curved.

(*To be continued.*)

New Species of Fungi from various Localities.

BY J. B. ELLIS AND B. M. EVERHART.

CHAETOMIUM ABIETINUM E. & E.

On the end of a stick of firewood (*Abies excelsa*) exposed to the weather through the summer. Newfield, N. J., Dec., 1897.

Perithecia crowded, ovate-globose, finally more or less collapsing above, .35–.5 mm. in diameter, densely clothed above with black simple, spine-like continuous bristles 60–75 μ long and 4–5 μ thick at the base: asci cylindrical, short-stipitate, aparaphysate, p. sp. 65–75 × 12 μ: sporidia uniseriate, globose, subhyaline at first, becoming opaque, mostly with a single nucleus, 8–10 μ in diameter, only slightly compressed.

Allied to *C. sphaerospermum* C. & E. but bristles not branched and sporidia rather larger and only slightly compressed.

CORDYCEPS CANADENSIS E. &. E.

Growing on *Elaphomyces*, London, Canada (Dearness, no. 2641).

About 6 cm. high, head elliptical, 6 × 4 mm. (dry), dark-colored: stem yellow, attenuated at the summit, about 3 mm. thick below: perithecia ovate, peripheral, about 6 × 4 μ, their apices slightly prominent, roughening the surface of the head with hemispherical protuberances: asci slender, 300–325 × 7–8 μ: sporidia filiform, nearly as large as the asci, separating into cylindrical segments, 10–20 (mostly about 15) × 2–2.5 μ, hyaline.

When fresh, the whole plant is of a light yellow color throughout. The slender cylindrical segments of the sporidia are only about half as long and wide as in *C. capitata* (Holmsk.) and very different from the globose-ellipsoid joints of the sporidia of *C. ophioglossoides* (Ehr.).

COPROLEPA GIGASPORA E. & E.

On cow dung, Rocky Mts., British Columbia, June, 1897 (Macoun, no. 684).

Stromata scattered, small (2–4 mm.) convex-prominent, black outside, the surface roughened by projecting cells and imperfectly developed rudimentary brown hairs, inside about the color and

consistency of cork: perithecia buried in the stroma either singly or in the larger stromata 2–4 in a stroma, ovate-globose, .75 mm. in diameter, attenuated above, with the hemispherical, soon perforated ostiolum erumpent and surrounded at the base by the thin margin of the superficial layer of the perforated stroma: asci cylindrical, 230–320 × 35–40 μ, with abundant stout paraphyses, 4–8-spored: sporidia uniseriate or subbiseriate, oblong-elliptical, subhyaline at first with a broad hyaline envelope and a small tubercular or sometimes short-pointed appendage at the lower end, finally opaque, 45–60 × 20–22 μ.

MELANOMMA NITIDUM E. & E.

On bark of *Artemisia tridentata*, Grand Junction, Colo., March, 1898 (Prof. C. S. Crandall, no. 325).

Perithecia superficial, scattered or 2–3 together, globose, somewhat shining, minute (.25–.35 mm.); ostiolum papilliform, minute, soon perforated: asci cylindrical, short-stipitate, paraphysate, 8-spored: sporidia crowded-biseriate, fusoid, brown, 5-septate, scarcely constricted at the septa, slightly curved, tapering from the middle to each obtusely pointed end, 25–32 × 5–6 μ.

M. occidentale Ell. has perithecia larger, rough and only semi-erumpent and sporidia not as distinctly attenuated towards the ends and shorter.

ZIGNOELLA POPULI E. & E.

On decorticated, dead limbs of *Populus angustifolius*, Fort Collins, Colo. (Prof. C. S. Crandall).

Perithecia scattered, erumpent-superficial, depressed-globose, roughish, .5–.75 mm. in diameter, with a small papilliform ostiolum, at length perforated: asci clavate-cylindrical, 75–85 × 12–15 μ: sporidia subbiseriate, clavate-oblong, hyaline, 4-septate, more or less constricted at the septa, 18–22 × 6–8 μ.

ZIGNOELLA LONICERINA E. & E.

On bleached limbs of *Lonicera involucrata*, Mt. Richtophen, Colo., July, 1896 (C. F. Baker, no. 411).

Perithecia scattered, suberumpent, .35–.5 mm. in diameter, subelliptical, convex-hemispherical, base slightly sunk in the wood, ostiolum papilliform, at length perforated: asci clavate-cylindrical; short-stipitate, paraphysate, 50–60 × 6–7 μ: sporidia biseriate, oblong-fusiform, hyaline, 3- (exceptionally 5-) septate, not constricted, 10 13 × 3 μ or sometimes reaching 15 × 3.5 μ.

Z. borcella Karst, *Z. australis* Speg. and *Z. adjuncta* Pass. have similar sporidia but differ otherwise.

TEICHOSPORA OBLONGISPORA E. & E.

On bleached, dead limbs of *Populus angustifolia*, Fort Collins, Colo., April, 1898 (Prof. C. S. Crandall).

Perithecia gregarious, erumpent-superficial, 400 × 600 μ in diameter, soon collapsing to cup-shaped, with a papilliform ostiolum: asci clavate-cylindrical, 80–100 × 14–16 μ, short-stipitate, paraphysate, 8-spored: sporidia biseriate, fusoid-oblong, slightly curved, only slightly constricted at the septa, 5–7-septate, yellowish-brown, 25–30 × 8–10 μ, one or two of the cells divided by a longitudinal septum.

Differs from *T. infuscans* E. & E. on the same host, in its much larger perithecia and sporidia.

TEICHOSPORA NEGUNDINIS E. & E.

On dead decorticated limbs of *Negundo aceroides*, Fort Collins, Colo., Feb., 1898 (Prof. C. S. Crandall).

Perithecia scattered, erumpent-superficial, ovate-globose, finally collapsing, with a papilliform ostiolum, 450–500 μ in diameter: asci cylindrical or clavate-cylindrical, 75–85 × 10–14 μ, short-stipitate, paraphysate, 8-spored: sporidia biseriate, oblong-ovate, 3–5-(mostly 3-) septate, 10–15 × 6–7 μ, exceptionally 15–20 × 8–10 μ.

Teichospora clavispora E. & E. on bark of the same host has perithecia smaller and not collapsing and sporidia 8–10-septate, 30–35 × 10–12 μ.

LOPHIOSTOMA PUSTULATUM E. & E.

On dead shoots of grape vine, Rockport, Kansas, March, 1897 (E. Bartholomew).

Perithecia scattered, globose, about .75 mm. in diam., entirely buried and covered by the bark which is raised into a large hemispherical pustule barely pierced at the apex by the narrow slightly compressed ostiolum: asci cylindrical, 110–130 × 8–10 μ, with abundant paraphyses: sporidia uniseriate, oblong, slightly curved, rounded at the ends, 3-septate, slightly constricted, brown, 20–27 × 6–7 μ.

Comes near *L. quadrinucleatum* Karst.

LOPHIOSTOMA RHOPALOSPORUM E. & E.

On dead shoots of grape vine, Rooks Co., Kansas, March, 1897 (E. Bartholomew).

Perithecia scattered, buried, compressed, 500–600 × 350–400 μ; ostiolum erumpent, extending half way across the slightly erumpent apex of the perithecium, which scarcely raises the bark: asci stipitate, clavate, p. sp. 60–75 × 12 μ, paraphysate, 8-spored: sporidia biseriate, clavate-oblong, 4–5-septate, scarcely constricted, yellow-brown, obtusely rounded above, 20–27 × 6–7 μ.

L. clavisporum E. & E. has the perithecia semierumpent and smaller and the ostiolum narrower and more prominent, but the sporidia are about the same in both.

SPHAERELLA INFUSCANS E. & E.

On old petioles of *Liriodendron tulipifera*, Nuttallburg, W. Va., May, 1898 (L. W. Nuttall, no. 937).

Perithecia gregarious, minute, covered by the thin epidermis which is raised into minute pustules and blackened continuously for one or more cm. in extent; ostiolum conic-papilliform, erumpent: asci oblong-cylindrical, 35–45 × 7–8 μ: sporidia biseriate, fusoid, slightly curved, hyaline, nucleate, becoming faintly uniseptate, but scarcely constricted.

Differs from the description and figures of *S. petiolicola* (Desm.) in its longer fusoid sporidia.

DIDYMELLA CORYLINA E. & E.

On dead stems of *Corylus*, London, Canada (Dearness, no. 2638).

Perithecia scattered, buried in the unaltered substance of the bark which is not discolored or perceptibly raised above them, globose, 350–400 μ in diameter; ostiolum erumpent, papilliform, minute, often at length umbilicate: asci cylindrical, 100–120 × 6–7 μ (p. sp. 75–80 μ long), paraphysate, 8-spored: sporidia oblong, very slightly inequilateral, uniseptate, scarcely constricted, yellowish-hyaline, obtuse, 15–16 × 4.5–5.5 μ.

OPHIOBOLUS INSTABILIS E. & E.

On leaves of *Artemisia biennis*, Racine, Wis., Sept., 1897 (Dr. J. J. Davis, no 978).

Perithecia semi-erumpent, scattered, ovate, 110–150 μ in diam-

eter, with papilliform ostiolum: asci clavate-cylindrical, short-stipitate, obscurely paraphysate, 80–120 × 12–13 μ: sporidia fasciculate, 90–110 × 4–5 μ, 8–10-septate and more or less constricted at several of the medial septa, yellowish, each cell with a single nucleus.

The perithecia are mostly on the leaves but occur also on the partly dead stems.

PLEOMASSARIA MAXIMA E. & E.

On bark of dead *Magnolia*, Brookline, Mass., April, 1893 (Prof. H. L. Jones, no. 30).

Perithecia irregularly scattered or subcircinate, depressed-globose, carnose-membranous, 1–1.25 mm. in diameter, partly sunk in the surface of the inner bark and covered by the epidermis; ostiola erumpent, not united in a disk, tuberculiform, irregularly dehiscent. When the epidermal layer is removed, the ostiola and apex of the perithecia come off with it, leaving the perithecia open with their grayish interior exposed: asci clavate-cylindrical, short-stipitate, 8-spored, 200–260 × 45–60 μ, with abundant paraphyses: sporidia subbiseriate, fusoid-oblong, subacute, 6–15-septate and clathrate-muriform, generally constricted at the middle septum and sometimes at one or more of the other septa, hyaline at first with a broad hyaline envelope, becoming dark-brown, 60–90 (mostly 70–80) × 20–22 μ.

MELANCONIS OBRUTA E. & E.

In bark of dead *Salix*, St. Croix Falls, Wis., Nov., 1897 (C. F. Baker, no. 586).

Conidia (*Melanconium* sp.), stroma convex, thin, 2–3 mm. across, slightly sunk in the surface of the inner bark and erumpent on the epidermis: conidia ovate, nearly opaque, 15–22 × 10–12 μ: ascigerous stroma sunk in the inner bark, depressed-conical, about 1 mm. across, yellowish-white inside: perithecia circinate in the bottom of the stroma, 12–15 in a stroma, ovate-globose, about .25 mm. in diam., their slender necks rising together and piercing the overlying conidial stroma but so encumbered and overwhelmed by the mass of conidia that the character of the ostiola can not readily be seen: asci cylindrical, attenuate-stipitate (paraphysate?), 200–230 × 16–18 μ: sporidia uniseriate, lying end to end, oblong-elliptical, hyaline, becoming olive-brown, uniseptate, obtuse, constricted at the septum, 19–22 × 10–12 μ.

Very different from *M. salicina* E. & E.

FENESTELLA LEUCOSTOMA E. & E.

On dead limbs of *Alnus*, Bay of Islands, Newfoundland, Oct., 1897 (Rev. A. C. Waghorne, no 311[b]).

Stromata scattered, orbicular, truncate-conic above, convex below, about 1.5 mm. in diameter, adnate to the inner surface of the epidermis and separating with it, as in *Valsa leucostoma* (Pers.), from which externally this can hardly be distinguished: perithecia 4–6 in a stroma, small (150–200 μ), the minute black papilliform ostiola piercing the minute round snow-white disk which perforates the epidermis and raises it into pustules: asci cylindical, briefly attenuate-stipitate, obscurely paraphysate, 8-spored: sporidia uniseriate, oblong-elliptical, yellow-brown, 5–7-septate, constricted in the middle, obtuse, 20–27 × 12–13 μ.

HOMOSTEGIA? OBSCURA E. & E.

On dead alders, Bay of Islands, Newfoundland, Oct., 1897 (Waghorne, no. 311).

Stromata thickly scattered, attached to the epidermis and erumpent through it, about .5 mm. in diameter, at first convex, then plane or slightly concave, black, subangular; ascigerous cells obscure: asci cylindrical, short-stipitate, obscurely paraphysate (?), about 80 × 12 μ: sporidia mostly biseriate, clavate-fusoid, 5–6-septate, constricted at the middle septum, hyaline, 20–27 × 5–6 μ.

The ascigerous cavities were not satisfactorily made out, but the character of the stroma is that of the Dothideaceae.

PEZICULA SPICATA E. & E.

On dead twigs of *Acer spicatum*, near Ottawa, Canada, Oct., 1897 (Macoun, no. 404 in part).

Ascomata scattered, erumpent, convex, dull watery-white, .35–.5 mm. in diameter, closely embraced by the ruptured epidermis, concave when dry, with the margin darker and irregularly bent: asci oblong, 60–70 × 12–15 μ, including the short, abrupt stipe: paraphyses stout, slightly thickened at the tips: sporidia 1–2-seriate, globose or ovate-elliptical, 7–10 (mostly about 8 μ) × 6–8 μ, at first with a hyaline envelope.

Differs from *Pezicula acerifolia* Pk. in its scattered growth and smaller asci and sporidia.

DASYSCYPHA ERYNGIICOLA E. & E.

On dead stems of *Eryngium*, near Ottawa, Canada, Oct., 1897 (Dr. John Macoun, no. 581).

Ascomata gregarious, short-stipitate, 1–1.5 mm. in diameter, at first patelliform, becoming shallow cup-shaped, white-tomentose outside, margin fringed with simple white straight obtuse septate minutely roughened hairs 60–70 × 3 μ: asci clavate-cylindrical, 55–60 × 5–6 μ: sporidia cylindrical, continuous, obtuse, straight, 12–15 × 2.5–3 μ: hymenium at first nearly white, becoming light yellow and when dry brownish and occasionally umbilicate.

D. labiata (Rob. & Desm.) has smaller sporidia (10 μ) and smaller (.65–.75 mm) ascomata furfuraceous outside and at first globose.

PHAEOPEZIZA NOVAE-TERRAE E. & E.

On rotten wood, Newfoundland, Sept., 1897 (Rev. A. C. Waghorne, no. 374).

Ascomata sessile with the obtuse margin free, discoid, carnose, friable, black throughout, 1.5–2.5 mm. in diameter, disk slightly concave, sometimes umbilicate: asci cylindrical, mostly curved, attenuate-stipitate, 80–110 × 8–10 μ, 8-spored; paraphyses simple, nucleolate, slightly enlarged at the tips: sporidia uniseriate, short-elliptical, brown, with a single large nucleus, 8–12 × 6–7 μ, mostly 9–10 × 6–7 μ.

CALLORIA KANSENSIS E. & E.

On rotten wood, Kansas (H. F. Roberts).

Gregarious, subgelatinous, pale orange-color, globular and immarginate, about .35 mm. across when fresh, of a rather deeper color and umbilicate when dry, and with spreading white hairs around the base: asci clavate-cylindrical, 65–75 × 8–10 μ, stipitate, aparaphysate, 8-spored: sporidia mostly biseriate, oblong-elliptical, hyaline, with two large nuclei, becoming uniseptate, 8–10 × 4–5 μ.

Remarkable for its different appearance in the fresh and in the dry state. The umbilicus appears like a shallow cylindrical depression and gives one the impression of a cup-shaped ascoma with a regularly incurved margin.

UROMYCES OBLONGISPORUS E. & E.

On leaves of *Artemisia tridentata*, Sweetwater Co., Wyoming, July, 1897 (Prof. Aven Nelson, no. 3546).

III. Sori orbicular, about 1 mm. in diam., flat, black, naked, pulverent, amphigenous: teleutospores oblong or oblong-elliptical, 22–30 × 14–16 μ, epispore smooth or slightly echinulate, especially above where it is slightly thickened, deep chestnut-brown;

pedicels very short (10–12 μ), fragile, hyaline : paraphyses linear-lanceolate, hyaline.

This must be very near *Uromyces Tanaceti* Rabh., but that has broader glabrous spores and no paraphyses.

PUCCINIA SIMILIS E. & E.

On leaves and stems of *Artemisia tridentata*, Sweetwater Co., Wyoming, July, 1897 (Prof. Aven Nelson).

I. Pseudoperidia amphigenous in small clusters on the leaves, erumpent, closed at first, then open with erect pale margin, more or less distinctly incise-toothed, sub-cylindrical, about .5 mm. high, mostly a little narrowed at the base, deep orange below ; aecidiospores deep orange, subglobose, 15–20 μ in diameter, epispore thin, nearly smooth. II. Uredospores in flat orbicular dark cinnamon-colored naked sori about 1 mm. across, globose or ovate, chestnut-brown, aculeolate (more distinctly so above), 18–22 μ in the longer diameter. III. Teleutospores in sori like those of the uredospores, but of a deeper color, nearly black, oblong-elliptical, 20–30 × 14–16 μ, slightly thickened above and sparingly echinulate-roughened around the apex ; pedicels stout, hyaline, 80–100 μ long, attenuated below.

Differs from *P. Tanaceti* DC. in its larger, thinner, flatter, darker-colored sori and in the presence of an *Aecidium*.

RAVENELIA MESILLIANA E. & Barthol.

On leaves of *Cassia bauhinioides*, near Mesilla, New Mexico, Oct., 1897 (E. O. Wooton). Comm. E. Bartholomew.

III. Teleutosori amphigenous, orbicular, .5–1 mm. in diam. often crowded and subconfluent, becoming nearly black, surrounded by the ruptured cuticle : heads hemispherical, the larger ones flattened above, 45–85 μ in diam., circumferential spores 12–20 in number, 4–8 in a cross section, polygonal from mutual pressure, 12–15 μ broad : cystoid cells globose or ovate, hyaline or nearly so, 12–15 μ in diameter : stipe of 4–6 conglutinated threads, hyaline or slightly colored, short (25–30 μ), deciduous.

Differs from *R. cassiaecola* Atks. in its smaller, more numerous spores and shorter deciduous stipe.

PHOMA FUMOSA E. & E.

On dead limbs of *Negundo aceroides*, Fort Collins, Colo., March, 1898 (Prof. C. S. Crandall, no. 314).

Perithecia gregarious, on bleached areas of the limbs, punctiform, minute, 100–120 μ in diameter, covered by the epidermis, through which they are visible as minute black specks, giving the part of the limb occupied a smoky appearance: sporules ovate-elliptical, 4–5.5 × 2–2.5 μ.

Differs from *P. negundinicola* Thüm. var. *ramicola* E. & E. in its much smaller perithecia and sporules. Var. *infuscans* is found with the normal form and differs only in being accompanied with a subepidermal *Macrosporium* and toruloid mycelium which blackens the surface of the limb when the bleached epidermis falls off.

ASTEROMA FRASERAE E. & E.

On living leaves of *Frasera thyrsiflora*, mountains around Moscow, Idaho, July, 1897 (Prof. L. F. Henderson, no. 2966).

Spots orbicular, wrinkled, green (about the same color as the leaf), .5–1.5 cm. in diam., becoming brownish: fibrils appressed, brownish-black, radiating and branching: perithecia about 75 μ in diam., seated on the fibrils, pierced above: sporules?

FUSICOCCUM NERVICOLUM E. & E.

On old fallen leaves of *Magnolia Fraseri*, Nuttallburg, W. Va., May, 1898 (L. W. Nuttall, no. 940).

Stromata mostly on the midrib and nerves of the leaf, elliptical, 400–600 μ long, subcutaneous, black, convex, the subconoid apex erumpent: sporules narrow-elliptical, hyaline, subacute, 2-nucleate, 7–10 × 2.5–3 μ.

SPHAEROPSIS ACERINA E. & Barthol.

On dead limbs of *Acer dasycarpum*, Topeka, Kansas, Jan., 1898 (Bartholomew, no. 2445).

Perithecia numerous, 400–500 μ in diameter, buried in the inner bark, often lying close together but not connate, raising the epidermis into strong pustules soon ruptured at the apex: sporules oblong, brown, 19–22 × 6–8 μ.

This can hardly be referred to *S. Clintonii* Pk. or *S. albescens* E. &. E. which has smaller perithecia. *S. minuta* Bel. & F. is a foliicolous species.

SPHAEROPSIS SPHAERELLOIDES E. & E.

On dead stems of *Rumex*, Oberlin, Ohio, March, 1898 (H. L. Jones, no. 16).

Perithecia punctiform, minute, (.12–.14 mm. in diameter), scattered rather thickly over the stems, raising the epidermis into minute pustules: sporules elliptical or oblong-elliptical, brown, 12–18 × 8–10 μ.

DIPLODINA POPULI E. & E.

On dead, decorticated limbs of *Populus angustifolia*, Fort Collins, Colo., April, 1898 (Prof. C. S. Crandall).

Perthecia scattered, semi-erumpent, subglobose (250–300 μ) or elliptical (300–400 μ), with papilliform ostiolum: sporules oblong, or slightly clavate-oblong, faintly uniseptate, hyaline, straight or nearly so, 8–10 × 2–2.5 .

HENDERSONIA DIPLODIOIDES E. & E.

On dead, decorticated limbs of *Populus angustifolia*, Fort Collins, Colo., February, 1898 (Prof. C. S. Crandall).

Perithecia thickly scattered, semi-erumpent, small (150–250 μ), ovate-globose, with a small papilliform ostiolum: sporules abundant, smoky-brown, subhyaline, oblong-elliptical, 1–3- (mostly 1-) septate, not constricted, 6–9 × 3–3.5 μ.

The perithecia are often elliptical (on a horizontal section) and more or less depressed.

DIDYMOCHAETA gen. nov. Sacc. & Ell.

(Sphaeropsidaceae, Sphaeroideae.)

Perithecia erumpent, subsuperficial, globose-conoid, membrano-carbonaceous, black, pilose or setose; sporules oblong-cylindrical, uniseptate, hyaline.

The genus exactly corresponds to *Pyrenochaeta*, *Chaetomella* and *Chaetodiplodia*, among the Hyalodidymae.

DIDYMOCHAETA AMERICANA Sacc. & Ell.

Perithecia gregarious, erumpent, globose or obtusely conoid, black, .25–.35 mm. in diameter, sparingly clothed with rather short, septate, brown bristles: sporules cylindric-oblong, straight, rounded at the ends, uniseptate, and mostly broadly constricted or narrowed in the middle, hyaline, 8–15 × 3–4 μ, exceptionally 15–20 × 5–6 μ: basidia inconspicuous, very short.

On dead stems of *Frasera speciosa*, Colorado (Bethel, no. 441).

SEPTORIA ADENOCAULI E. & E.

On leaves of *Adenocaulon bicolor*, mountains around Moscow, Idaho, July, 1897 (Prof. L. F. Henderson, no. 2961).

Spots nearly black, whitening somewhat in the center, definite, partly bounded by the veinlets, 2–3 mm. in diameter, obscured below by the tomentum : perithecia innate, epiphyllous, punctiform, not conspicuous : sporules acicular, slightly curved, continuous, 20–27 × .5–.75 μ.

SEPTORIA CALAMAGROSTIDIS E. & E.

On leaves of *Calamagrostis Canadensis*, Pelican Lake, Wis., June, 1897 (Dr. J. J. Davis, no. 977).

Spots elongated, 2–4 × .5–1 mm., whitening out, often confluent for 3–5 cm., leaf turning yellow around them : perithecia innate, epiphyllous, elliptical, 80–120 × 75–80 μ : sporules arcuate, hyaline, continuous, 12–15 × 1.5 μ.

Differs from *S. epigeios* Thüm. in its much shorter sporules, but closely allied to *S. gracilis* Pass. which, however, is said to have the spots fuscous and sporules straight or scarcely arcuate, 10–12 × 0.7 μ.

CORNULARIA URTICAE E. & E.

On dead stems of *Urtica gracilis* near Ottawa, Canada, Oct., 1897 (Dr. John Macoun, no. 405).

Perithecia capitate, scattered, .5–.75 mm. high ; stem stout, brown, head subglobose or subelongate, flesh color, about 400 μ in diameter : sporules cylindrical, hyaline, 3-septate, 12–15 × 3 μ.

CRYPTOSPORIUM PRUNICOLUM E. & E.

On dead limbs of *Prunus* (*serotina*?) Oberlin, Ohio, March, 1898 (Prof. H. L. Jones, no. 32).

Acervuli subcutaneous, pallid within, 1 mm. in diameter, erumpent through transverse cracks in the bark in tuberculiform masses light-colored at first, becoming grayish-black : conidia falcate-fusiform, multinucleate, hyaline, 45–55 × 2.5–3 μ.

Comes near *C. oxyspermum* Schulz. & Sacc.

CORYNEUM ABIETINUM E. & E. Proc. Acad. Nat. Sci. Phil. **1894** : 375. 1894.

Well developed specimens of this species on small limbs and twigs of dead spruce, sent by Rev. A. C. Waghorne during the

winter and spring of 1898, enable us to supplement and improve the description published in 1894.

Acervuli erumpent through an orbicular or elliptical grayish disk 1–1.5 mm. in diameter; conidia oblong, straight, constantly 5-septate, scarcely constricted, 35–40 × 7–8 μ, terminal cells conical, hyaline, intermediate cells olive-brown; pedicels simple or branched, hyaline, sometimes 3–4-septate, 70–80 × 1–1.5 μ.

The difference in the size of the acervuli and conidia would indicate that this is distinct from the 1894 specimens, but a comparison shows that both doubtless represent the same species. The original specimens do not show the orbicular gray disk, which may be due to their being on the thick bark of larger limbs.

BOTRYTIS GLAUCA E. & E.

On bark of *Quercus macrocarpa*, Ottawa, Canada, Oct., 1897 (Macoun, no. 437).

Forming small (2–3 mm.) subdiscoid glaucous-gray patches, soon irregularly and interruptedly confluent: hyphae slender, continuous, 150–250 × 2–2.5 μ, brown (under the microscope), with short, straight, spreading, verticillate branches at intervals bearing the clustered, elliptical, hyaline, 2.5–3 × 1.25–1.5 μ conidia.

Has the habit and aspect of *Menispora glauca*.

ISARIA CAPITATA E. & E.

On dead limbs of *Platanus occidentalis*, near Emma, Mo., Oct., 1897 (Rev. C. H. Demetrio).

Cespitose, cinereous, stems joined at the base, spreading, 1 mm. high, formed of parallel fibers branching above and bearing at their ends solitary globose hyaline conidia 3 μ in diameter forming a subglobose ash-gray head .35 mm. in diameter.

The general appearance reminds one at a casual glance of some *Nectria* or *Cucurbitaria*, the crowded heads simulating perithecia. When crushed, the substance is of a dirty yellow color.

CERCOSPORA HETEROSPORA E. & E.

On leaves of *Euphorbia corollata*, Racine, Wis., July, 1897 (Dr. J. J. Davis, no. 976).

Spots irregular, bounded by the veinlets, 2–5 mm. in diameter, greenish at first, becoming rusty brown and often zonate: tufts mostly hypophyllous, erumpent, nearly white, finally subeffused;

fertile hyphae cespitose, short, continuous, brownish, acute at the apex, 12–20 × 3–4 μ, entire or sparingly toothed above, exceptionally with 2–3 short subdigitate branches above: conidia normally cylindrical, curved, hyaline, 1–5- (mostly 3–4-) septate, 40–60 × 2.5–3 μ, others shorter and thicker, 20–40 × 3–4 μ, nearly straight, narrow at one end.

Distinct from *C. Euphorbiae* Pat. and from *C. Euphorbiae* Kell. & Swingle.

NOTES AND CORRECTIONS.

Fomes alboluteus E. & E. Proc. Acad. Nat. Sci. Phil. **1895**: 413. 1895.

Additional specimens and notes of this species show that it is a *Polyporus* and not a *Fomes*. In the fresh growing state it is very juicy and absorbs moisture to a remarkable degree so that water may be squeezed out of it as from a sponge. Some specimens were 3–4 cm. thick. When mature the pores are prolonged on one side so as to resemble the teeth of an *Irpex*. The spores are oblong, hyaline, 8–12 × 3 μ. Allied to *Polyporus leucospongia* Cke. & Hark.

Amphisphaeria melantera E. & E., Bull. Torr. Bot. Club, **24**: 278. 1897.

The perithecia are quite variable, often depressed and sometimes distinctly collapsed and are smaller than at first stated, averaging about 400 μ in diam.

Lophidium confertum E. & E. Proc. Acad. Nat. Sci. Phil. **1894**: 335. 1894.

Fully matured specimens of this species on dead ash limbs, sent from Oberlin, Ohio, by Prof. H. L. Jones, show that the sporidia finally became 5-septate. In the Ohio specimens the sporidia are larger, 15–22 × 10–12 μ. The perithecia are white inside both in the Kansas and in the Ohio specimens.

This is closely allied to *L. Cotini* H. Fabre.

Montagnella tumefaciens (E. & H.), North Am. Pyren. 253.

Prof. Bethel finds this near Denver, Colo., on dead stems of *Bigelovia graveolens*. The limbs are swollen as in the original specimens and the fungus differs only in its shorter (75–85 μ) asci, and rather smaller (15–20 × 3.5–5.5 μ) sporidia. Var. *reducta*, on limbs of the same host, differs in its 3–6-septate sporidia.

Physalospora Corni E. & E. Proc. Acad. Nat. Sci. Phil. **1895**: 421. 1895.

This is hardly distinct from *P. Corni* Sacc. though the sporidia are longer (20–26 μ). Specimens since sent by Dr. Macoun from the vicinity of Ottawa, Canada, have sporidia also broader (6–8 μ) and asci obscurely paraphysate.

Pleospora juncicola E. & E. Proc. Acad. Nat. Sci. Phil. **1895**: 422. 1895.

Specimens of this species collected by Prof. C. F. Baker at Cameron Pass, Colo., have asci 100–150 × 30–40 μ, sporidia 40–50 × 20–22 μ.

Astrodochium Coloradense E. & E. Am. Nat. **21**: 430. 1897.

The host of this species is *Populus angustifolia*, not *Quercus*, as stated.

Patinella macrospora E. & E. Proc. Acad. Nat. Sci. Phil. **1894**: 354. 1894.

Change specific name to *monticola*. There is already a *P. macrospora* Massee, which, however, is different from the Colorado species.

A new Species of Utricularia.

By John Hendley Barnhart.

Utricularia macrorhyncha.

Stems white, fibrillous, rooting, utriculate: leaves few, capillary, 2–20 mm. long; scape one (rarely two arising from the same point), slender, smooth, light green, 5–10 cm. high, with several minute scales: flowers 1–3, usually 2; pedicels 6–18 mm. long, ascending in flower, erect in fruit: sepals ovate, 2 mm. long: corolla yellow; upper lip concave, obscurely 3-lobed, 6 mm. long, 10 mm. wide; lower lip concave (or with lateral margins slightly reflexed in age), entire or with merely undulate margin, 8 mm. long, 8 mm. wide, with a prominent orange somewhat 2-lobed palate closing the throat; spur slenderly conical, ascending, closely appressed against the under surface of the lower lip, which it exceeds in length (length 1 cm. or more), obtuse or emarginate at the apex: fruit (immature) spherical.

In mud, or rooting in water not over 5 cm. deep, in springy places near the margin of a small lake, called by the northern settlers in the neighborhood Mirror Lake, but better known among the natives of the region as Calf Lake, Jessamine, Pasco County, Florida, March 26 to April 11, 1898; distributed by me under no. 2537.

In habit, in stems and in leaves, this species resembles *U. subulata* L., with which it grows, but here the resemblance ceases, for the flowers are entirely different, and the scapes of *U. macrorhyncha* are light green and merely slender, while those of *U. subulata* are bronze-colored and capillary.

The flower of *U. macrorhyncha* agrees exactly with that of *U. longirostris* Le Conte as described by Elliott* and by himself,† and as illustrated (though the figure is badly drawn) in connection with the latter paper;‡ but that species was a floating one, while *U. macrorhyncha* roots firmly in the mud, although growing in situations favorable for a floating species. *U. longirostris*, too, is said

* Ell. Bot. S. C. & Ga. 1: 21. 1816.

† Ann. Lyc. N. Y. 1: 76. 1824.

‡ Ann. Lyc. N. Y. 1: *pl. 6, f. 7.* 1824.

to flower in June, while *U. macrorhyncha* flowers very early in the spring, and may (probably does) flower again late in the season.

Several specimens are in herbaria, secured by former collectors, which are probably referable to this species, but they are nearly all in poor condition for determination. I would refer here specimens collected by Wm. M. Canby at Palatka, Fla., in April, 1869, and distributed by him (with a printed label) under the name *U. biflora* Lam. Also a sheet in the U. S. National Herbarium, under *U. subulata*, collected by H. W. R. [avenel], at Aiken, S. C., Sept., 1869. Besides these there are two sheets in the Torrey Herbarium, labeled by Dr. Chapman, "*U. fibrosa*—a rooting form. Springy places, Apalachicola, Florida," and "*U. bipartita* Ell.? Chapm.! Probably a rooting form of *U. fibrosa* Walt. Margins of a pond, Leon Co., Middle Florida." From these specimens it would appear that *U. macrorhyncha* is the same as *U. bipartita* Chapm. Fl. S. States, 283, 1860, not Ell., and *U. fibrosa* Chapm. Fl. S. States, Ed. 3, 301, 1897, not Walt.; but Dr. Chapman's description does not agree exactly with the type of *U. macrorhyncha* in the length of the spur, the height of the scape, nor the size of the flower.

TARRYTOWN, N. Y., June 28, 1898.

Proceedings of the Club.

WEDNESDAY EVENING, APRIL 27, 1898.

There were twenty two persons present.

Dr. Underwood presided in the absence of other officers.

Dr. Britton reported the inability of Mr. Clute and Prof. Lloyd to serve longer on the Field Committee. On motion, the Secretary, Mr. W. A. Bastedo, was elected Chairman of that Committee for the remainder of the present year. Mr. Rydberg and Miss Ingersoll were elected associate members of the Committee.

The scientific program followed.

The first paper, by Mr. Tracy E. Hazen, was entitled "Notes on the Life history of *Haematococcus* and other freshwater Algae." He exhibited a dried specimen of *Haematococcus* from Vermont, forming a dull red incrustation on rock, and from which some of his own cultures had been made. The paper, which will soon be published, described the stages of its life history, and was illustrated by colored drawings. Discussion by Prof. Lloyd, Dr. Townsend, Dr. Britton and others followed. The Secretary referred to a gathering of red snow made at the Crimson Cliffs of North Greenland by the Peary party two years ago, which exhibits a more brilliant red than the *Haematococcus* of our own neighborhood. The Secretary arranged to put this Greenland material into Mr. Hazen's hand for comparison. Mr. Hazen's own gatherings here have been made near Fort Lee, in pools.

The second paper, by Mrs. Elizabeth G. Britton, was entitled "An Account of the Mosses collected by Mr. Pierre Jay in Peru and Bolivia in 1893." She exhibited about 60 sheets of these mosses; the specimens shown formed, however, only a small part of the entire collection which includes many species of tropical American genera like *Hookeria* and *Meteorium*, not yet determined. The Bolivian specimens were collected in June and July near La Paz and Yungas and are largely species of high altitudes and exposed localities. The Peruvian specimens were collected in the

vicinity of Cuzco and the tributaries of the Madre de Dios, and are mostly forest species, including showy *Phyllogoniums* and *Porotrichums* and various species of *Entodon* and *Rhizogonium*. The collection promises to be very interesting and will be compared with Dr. Rusby's collections of 1885, and M. Germain's, both of which have recently been enumerated and described by Dr. C. Muller in his Prodromus of the Mosses of Bolivia in the Nuovo Giornale Botanico Italiano for 1897.

TUESDAY EVENING, MAY 10, 1898.

There were fifteen persons present.

President Brown was in the chair.

One new nomination for membership was reported: Miss M. Davidson, 350 West Fifty-first street, nominated by Mr. W. A. Bastedo.

Four new members were elected: Miss Harriet B. Bailey, 78 West 105th street; Mrs. A. B. Tweedy, 353 West Boulevard; Mr. Joseph H. Wade, Principal Grammar School 23, Mulberry and Bayard streets, and Dr. John B. Conroy, Public School 39, 235 East 125th street.

The first paper, by Dr. Arthur Hollick and Mrs. Elizabeth G. Britton, was entitled "A Description of a new Fossil Moss from the State of Washington, collected by Prof. I. C. Russell." The paper was read by Dr. Hollick, who also exhibited the original specimen, one sent to Mrs. Britton for identification by Prof. F. H. Knowlton of the National Museum in Washington. Prof. Knowlton supplied the following facts: "The specimen was collected by Prof. I. C. Russell in July, 1897, near Cle Elum, Kittitass, county, Washington, and occurs in the Roslyn sandstone; its age is probably lower Miocene or upper Eocene. It is associated with species of *Lygodium*, *Ulmus*, *Planera*, and a number of other beautifully preserved leaves. It is in any case the oldest undoubted moss thus far found in this country. The so-called *Hypnum Haydeni* of Lesquereux is with little doubt a *Lycopodium*." The specimen represents only the tip of a branch, about one-half inch in length; it is sterile and has been compared with figures and descriptions of other fossil American mosses, and

differs from them all. It is undoubtedly a new species of the Hypnaceae, probably a *Rhynchostegium*, and will be named for its discoverer, Prof. Knowlton.

In the discussion following, it was remarked by Dr. Hollick that fossil mosses are extremely rare. All specimens known are Tertiary or later, one reported from a Carboniferous horizon being now thought doubtful; but the existence of mosses in Jurassic times is inferred from the existence of an insect then, the present representatives of which feed upon mosses. The only fossil moss heretofore recorded from the United States is Lesquereux's *Hypnum Haydeni*, now believed to be instead a species of *Lycopodium*. Fragments from the Pleistocene have been reported from Canada. The species described this evening is probably the first distinct American species. Thirty or more foreign fossil musci have been described, many of them members of the genera *Hypnum*, *Harpidium*, and *Sphagnum*. To this genus *Sphagnum* belongs the only fossil moss as yet known "in fruit," a Tertiary specimen preserved in brown iron ore.

Discussion followed regarding the reasons for the rarity of moss fossils, Dr. Underwood, Dr. Britton, Mrs. Britton, Dr. Hollick, and the Secretary participating.

The second paper, by Dr. L. M. Underwood, was entitled, "The Species of *Botrychium* of the *B. ternatum* group." The paper, which will soon be published, was accompanied by numerous specimens and followed by discussion at length of the principal eastern representatives, especially of *B. intermedium*.

Mrs. Britton followed with remarks on the Muhlenberg collection of mosses recently transferred from the Philosophical Society of Philadelphia to the Philadelphia Academy of Sciences. They are preserved exactly as Muhlenberg left them, even to the replacing of a knothole. With each specimen is preserved the number he had originally given it, the number he had used in sending it to Hedwig, and the name given it by Hedwig. The bulk of Muhlenberg's ferns went to Willdenow at Berlin.

Among the collections at the Academy of Sciences in Philadelphia, besides those of Schweinitz, Sullivant, Nuttall and Darlington, is that of Pursh, whose herbarium is still a series of scat-

tered sheets, neither mounted nor classified, but with labels supplied in his own hand.

Dr. Britton announced the recent purchase by the New York Botanic Garden of the herbarium and botanical collections of Prof. Lewis R. Gibbs, of Charleston, S. C., through his daughter, Miss Maria R. Gibbs. The herbarium of Elliott is in bad preservation, and much of it gone entirely. The Gibbs herbarium is deemed of special value as illustrative of Elliott's plants.

WEDNESDAY EVENING, MAY 25, 1898.

There were 38 persons present.

President Brown was in the chair.

The minutes were read and approved.

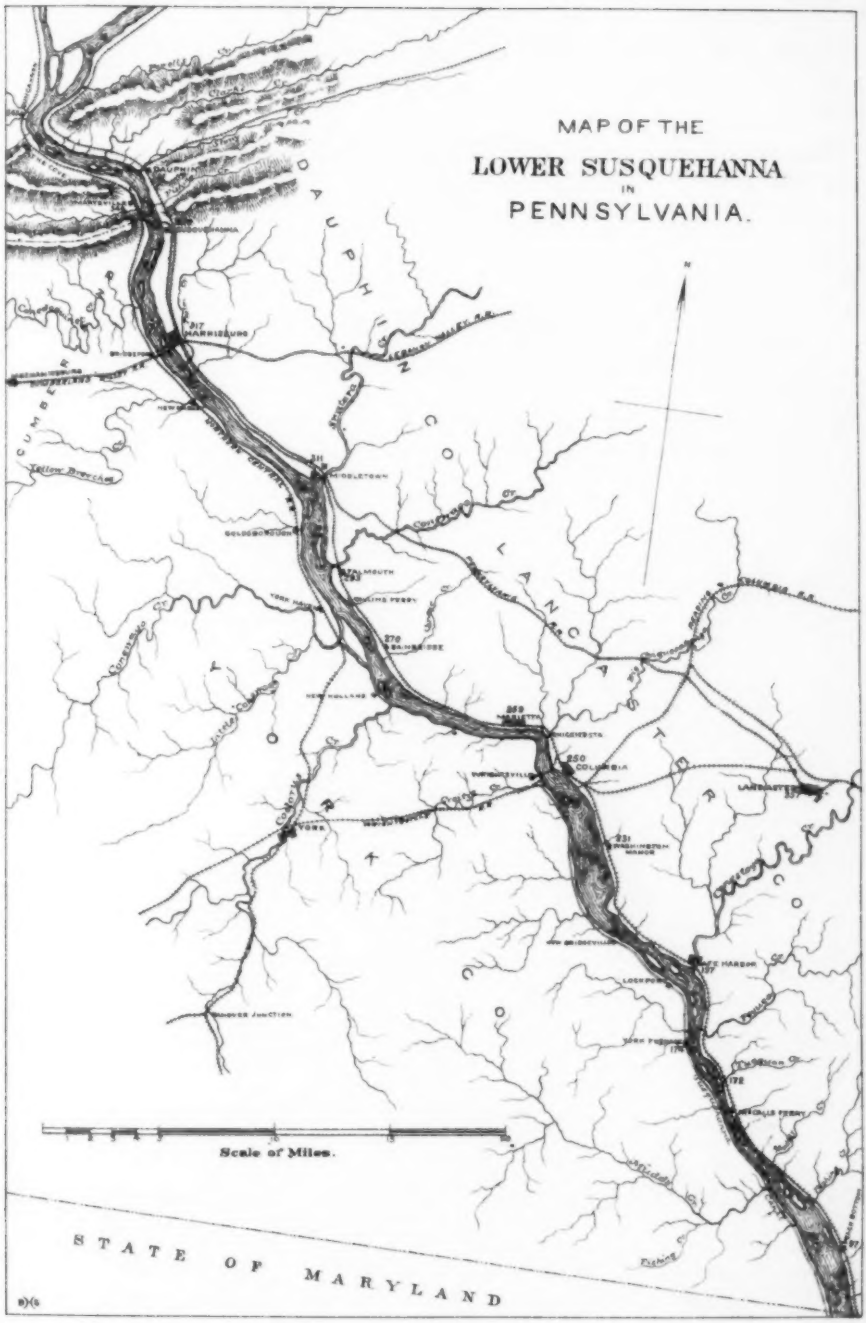
Mr. Bastedo called attention to the forthcoming three-days' excursion to Pt. Pleasant, N. J., in connection with the Philadelphia Academy of Sciences.

The evening was devoted to discussion and exhibition of acaulescent purple violets, introduced by a paper on "The Acaulescent Violets" by Mr. C. L. Pollard, of Washington, D. C., read by Dr. Hollick. This paper, soon to be printed, was the result of field study of the last two years, mainly in the Middle States, from which states most of our original species-types were derived. Mr. Pollard now describes 18 species and 3 varieties. He remarked that for violet characters we must depend upon unremitting field work. Herbarium material is useless except as fortified by previous familiarity with the appearance while growing. Large numbers of individuals must be studied and every feature of the environment must be noted. Careful attention must be given not only to habit but to habitat, to texture of herbage, color of the flowers, to position of the cleistogenes, to nervation, to shape and pubescence of leaves, and to the nature of the surrounding vegetation.

A series of mounted specimens illustrating this paper was exhibited by Dr. Britton, and a large number of fresh specimens were passed, the result of collections sent in by Miss Sanial and by Messrs. Rusby and Crawford, and by Drs. Rusby and Hulst.

The Club was adjourned to the second Tuesday in October.

EDWARD S. BURGESS, *Secretary.*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